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WHAT TO BUY & HOW TO USE IT

WHAT DIGITAL Camera

JULY
2015

Sigma

150-600mm

A superb new lens
for sport and wildlife
photography

Field test



Shoot in the city

15 tips for
better
urban landscapes

Technique



Treat 'em mean

Compacts for when the going gets tough

Six
way
test



Filter facts

How to use these
essential accessories

Tamron 15-30Mm

The only full-frame f/2.8
wideangle zoom with IS



Full
test

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86 cameras and 437 lenses listed and rated – see our ten-page buyer's guide inside



SAMSUNG

Introducing the new NX500
with UHD 4K video.



The new NX500 with a 28MP BSI APS-C CMOS sensor
and 4K movie recording capabilities.

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Samsung **NX500**



p60 Shoot in the city



p53 Treat 'em mean

p22 Portfolio



In this issue

4 Incoming

We round up the latest photographic products

10 Things to try...

Need inspiration? Look no further

17 Essential guide

How to get the best-quality sound when shooting video

22 Portfolio

Jean-Claude Castor's land and cityscapes

25 Master your camera ON THE COVER

Canon portraits, Nikon effects and Panasonic 4K photo

36 Three essential filters ON THE COVER

From a polariser to an ND grad – why filters still matter

42 Expert guide

Users' views on the Canon EOS 700D

47 Sigma's new 150-600mm lens

A superb new lens for sports and wildlife ON THE COVER

50 Help

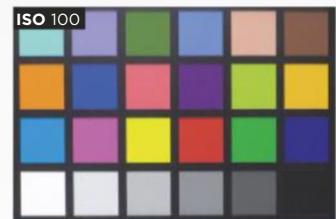
Confused about what to buy? You'll find your answer here

53 Treat 'em mean ON THE COVER

Compact cameras for when the going gets tough

Tests you can trust

Each camera that passes through the hands of *What Digital Camera*'s technical team undergoes a series of rigorous tests in our lab, with results analysed by the very best industry software. This makes our reviews the most authoritative in the UK. We test for colour – different sensors and camera image processors can interpret colour differently, while this can also shift at different ISO sensitivities. We then look at resolution, with our lab tests showing us exactly how much detail each camera can resolve – even though cameras can share identical pixel counts, some perform better than others. Then we look at image noise, since different cameras can produce cleaner images at higher ISOs than others. Finally, we get out and shoot in real-world conditions just as you will, to find out how the cameras and lenses perform.



COLOUR

Subjecting each camera to our colour chart test reveals any variation and differences in colour between Raw and JPEG file formats.



22

RESOLUTION

Our resolution chart reveals exactly how much detail a sensor can resolve and it's measured in lines per picture height, abbreviated to l/ph.



NOISE

The diorama is used to ascertain how image noise is handled through an ISO range. Some cameras produce cleaner results than others.



Panasonic Lumix G7 embraces 4K

MICHAEL TOPHAM

Not a company that is known for resting on its laurels, Panasonic has unveiled its latest mid-range CSC – the Lumix G7. Out to replace the two-year-old Lumix G6, Panasonic appears to be placing the emphasis very much on video and like the Lumix GH4, the Lumix G7 is capable of 4K video capture, recording 4K video in 3840 x 2160 at 25p (50Hz) or 24p in the MP4 format.

More than just a video mode, the Lumix G7's 4K video functionality brings some impressive benefits to stills photographers by allowing 8MP images to be extracted straight from a movie clip. To help with this, three 4K photo functions have been introduced to make the process even easier – 4K burst shooting, 4K burst (start/stop) and 4K pre-burst.

Key features

The G7's 4K burst shooting mode allows up to 29mins 59secs of continuous shooting at 30fps, which can be used like a photo burst shoot mode by holding the shutter down. The 4K burst (start/stop) mode

starts consecutive shooting with a single press of a shutter button and stops with the second press – better suited to shooting opportunities that require a longer waiting time. Not forgetting the 4K pre-burst option, this mode is clever enough to automatically record 30 frames the second before and after the shutter is pressed.

Aside from the 4K video functionality, the G7 features a 16-megapixel Live MOS sensor designed to run in tandem with Panasonic's Venus Engine image processor. This combination enables the camera to shoot continuously at up to 8fps (AFS) – a 1fps improvement over its predecessor. However, setting the Lumix G7 to autofocus continuous (AFC) sees the frame rate drop to 6fps.

The G7 provides a wide ISO range of 200-25,600, which can be expanded as low as ISO 100. The multi-process Noise Reduction (NR) system is claimed to apply more effective detail processing, and to further

4K video can be accessed via the new drive mode dial

There's a 3.5mic port at the side and focus peaking

subjects in a brisk 0.07secs.

Turning to the rear of the camera, the Lumix G7 inherits the excellent OLED electronic viewfinder from the Lumix GH4. The resolution has increased to 2,360k dots and a newly designed eyecup is intended to improve visibility. Below the EVF lies a 3in, 1,040k-dot free-angle touchscreen and there's now a pair of command dials on the top-plate as well as a new drive mode dial, offering direct access to continuous shooting, self timer and the 4K photo modes.

There is built-in Wi-fi, while other noteworthy features include a maximum shutter speed of 16,000sec, a 3.5mm microphone port at the side and focus peaking. As well as a black finish, the G7 will be available to buy in a black-and-silver finish.

First impressions

Panasonic's designers have gone back to the drawing board to create the Lumix G7 and, unlike the Lumix G6, which had flowing lines and rounded edges, the Lumix G7 is more angular in its appearance. The redesigned shape of the pentaprism resembles Olympus's OM-D models; however when it's positioned alongside rival CSCs such as the OM-D E-M10 and Fujifilm X-T10, you do value the G7's deeper handgrip, which offers more to wrap your hand around in order to get a good, solid grasp.

The top-plate offers excellent manual control, thanks to the addition of the drive mode dial, and the dual command dials are well placed. However, they are rather plasticky and don't offer a huge amount of resistance to prevent them being knocked. The touchscreen is incredibly responsive and offers a great way to intuitively navigate through menus, refine the position of the AF point and scrub through 4K movie clips frame by frame. The clever 4K pre-burst option worked well for capturing spur of the moment action before there's time to fire the shutter, but the way in which the camera continuously records in this mode means it quickly drains the battery, so it should be used

HIGHLIGHTS

SENSOR 16MP Live MOS
ISO 200-25,600 (expandable to ISO 100)
VIEWFINDER 2,360k-dot EVF
BURST 8fps (AFS) 6fps (AFC)
AUTOFOCUS 49-area contrast-detect AF
SCREEN 3in, 1,040k-dot touchscreen
DIMENSIONS 124.9 x 86.2 x 77.4mm
WEIGHT 410g (body only)

improve the performance at high ISO, a newly added random filter granulates chromatic noise, blending it into the image to replicate natural shots. As with every Lumix G camera we've seen of late, the Lumix G7 is capable of a digital signal communication of up to 240fps. The contrast-detect AF system integrates Panasonic's new Depth From Defocus (DFD) technology, which calculates the distance to the subject by evaluating two images with different sharpness levels in a split second, while analysing the surroundings in the composition at the same time. In terms of focusing speed, the Lumix G7 can lock on to





This 8MP still image was extracted from the Lumix G7's 4K video footage using the 4K Burst Shooting mode

sparingly. I found the 4K burst shooting mode the best of the three 4K modes and the process of extracting an 8MP still image really couldn't be easier – simply hit the Menu/Set button and the image is saved to the card.

As we expect of Panasonic CSCs, the G7's autofocus speed is lightning-fast and locks onto subjects with no hesitation.

With fierce competition in the CSC market of late, Panasonic looks to be targeting more experienced enthusiasts with the G7 and those who may have already bought into the Lumix system. While the G7 doesn't feature weather-sealing or the

same build quality as the GH4, it offers an impressive set of features at a price that's set to appeal. As things stand, the G7 is £100 more than the Fujifilm X-T10 and £200 more than the Olympus OM-D E-M10 when body-only prices are compared.

Pricing and availability

Expected to arrive in the UK from mid-June, the G7 will cost £599 (body only). A pair of kits will also be made available – the DMC-G7KEB-K kit (including 14-42mm lens) costing £679 and the DMC-G7HEB-K kit (including 14-140mm lens) costing £849.



The Lumix G7's touchscreen is incredibly responsive and ties in well with the camera's rapid autofocus system



Tiny X-T10 arrives

ANDY WESTLAKE

Fujifilm is looking to follow up on the success of the X-T1 with a simplified, more affordable model – the X-T10.

While it has a similar SLR-like design to the X-T1, the X-T10 is a much smaller camera that's similar in size to Olympus's OM-D E-M10. Like the E-M10, it hides a pop-up flash at the front of its viewfinder prism, and forgoes weather-sealing. However, with Fujifilm's familiar 16MP X-Trans CMOS II sensor present, it promises to offer the same excellent image quality as the X-T1.

In typical Fujifilm fashion, the X-T10 is based around traditional analogue controls, with top-plate shutter speed and aperture dials complemented by an aperture ring on most Fujinon lenses. In addition, there's a top-plate drive mode dial, plus twin dials embedded into the front and rear of the body. These can be clicked inwards to function as buttons, with the rear dial engaging manual focus aids, and the front one being user-configurable.

The viewfinder is the same 2.36m-dot OLED unit as previously seen on the X-E2, offering a 0.62x magnification and 100% coverage. Below the EVF is a 3in, 920k-dot LCD that tilts upwards by 90° for waist-level shooting, and downwards by 45° for high-angle shots. Regrettably,

it's not touch-sensitive though.

The boxy, high-shouldered design of the X-T10 can look a bit odd from some angles, but it offers some real advantages. The tall body gives both more area for controls, and more space for your right hand to grip. Indeed with a cleverly sculpted handgrip and grippy rubberised coating, the X-T10 feels secure in-hand for such a small camera.

Notably, the X-T10 comes with the same autofocus system built-in that Fujifilm recently announced in a firmware update for the X-T1. This adds new modes for focusing on moving subjects – a weakness of previous X-system models. Wide Tracking mode can follow subjects moving across the frame, while Group mode can use sets of AF points positioned in a user-selected area of the frame to keep subjects moving relative to the camera in focus at up to eight frames per second.

Other features include Full HD movie recording and built-in Wi-fi. Overall, the X-T10 looks like it will be a very capable camera at an attractive price, and we're looking forward to getting hold of a review sample.

Available from mid-June, the X-T10 will cost £499 (body-only), £599 with the XC16-50mm lens, or £799 with the XF18-55mm.

1



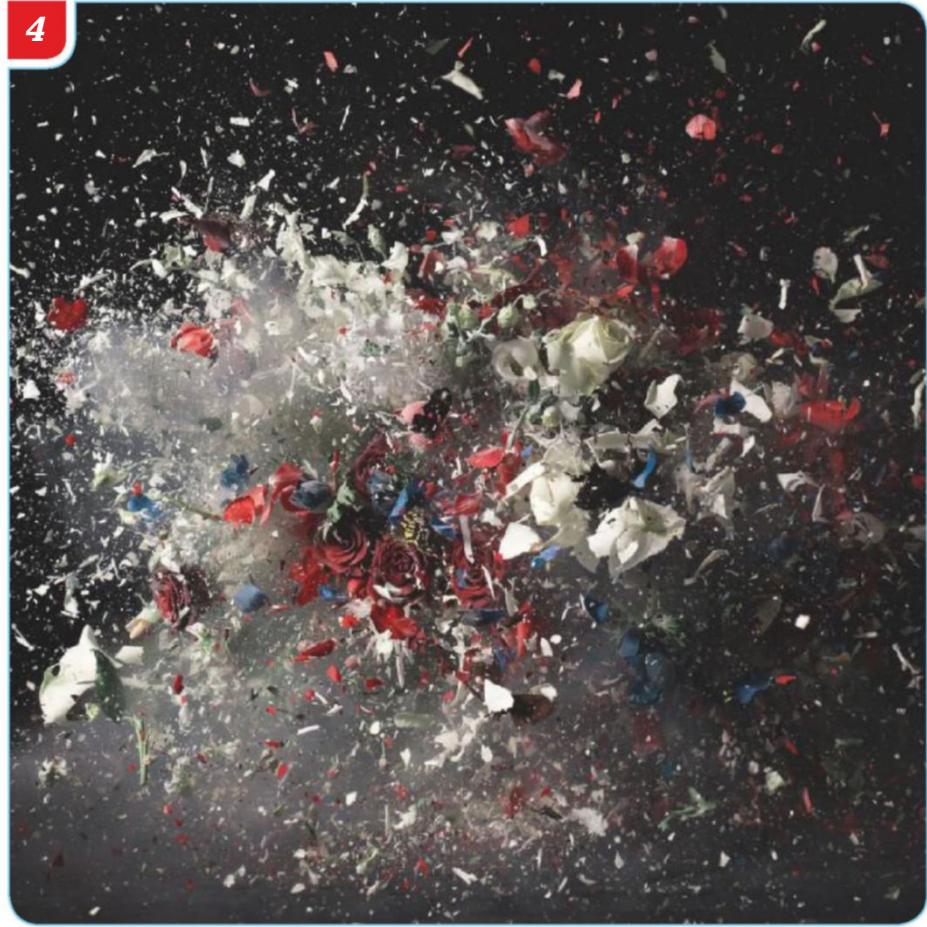
2



3



4



5



1 Olympus M.Zuiko Digital ED 7-14mm f/2.8 PRO

£999 www.olympus.co.uk

Offering an angle of view equivalent to 14-28mm on full frame, this is a new premium wideangle zoom for Micro Four Thirds users.

2 Leica Monochrom

£570 www.leica-storemayfair.co.uk

The M Monochrom (Typ 246) is an updated version of Leica's black & white-only rangefinder camera. It's equipped with a 24MP full frame CMOS sensor, shoots up to ISO 25,600 and boasts a 3in, 921k-dot screen. Affordable? Sadly not. It'll cost you over £5k.

3 Lee Filters SW150

FROM £57 www.leepilters.com

Lee Filters has adapted its SW150 system to make it compatible with more wideangle lenses including the Sigma 12-24mm f/4.5-5.6 II DG HSM and Tokina AT-X 16-28mm f/2.8 PRO FX. The new SW150 Mark II filter holder is attached via a specific adapter for each lens.

4 Revelations exhibition

£8 www.sciencemuseum.org.uk

Discover the influence of early scientific photography on contemporary art in this major exhibition at London's Science Museum. Until 13 Sept 2015.

5 Lily drone

\$499 www.lily.camera

A new invention promising to shake up the camera and drone markets is Lily, a drone that flies itself and can track your movements. It shoots 12MP images and shoots 1080p HD video at 60fps. Designed to be waterproof, it can reach an altitude of 50ft and flies at a maximum speed of 25mph.

6 Westcott Ice Light 2

£549 www.theicelight.com

This new LED strip light offers a 50% brighter output, a redesigned handle, lower power consumption and Bluetooth connectivity.

6



9 Sigma DPO Quattro

£899 www.sigma-imaging-uk.com

Sigma has announced the price of its wideangle 14mm f/4 model in the Quattro series. It'll be available in late June for £899.

10 Olympus OM-D E-M5 Mark II Limited Edition

£999 www.olympus.co.uk

Fancy owning a limited edition titanium finish OM-D E-M5 Mark II? Olympus has announced that 7,000 are set to be made in the coming months, with each limited edition model featuring an OM-D branded strap. Paired with the 14-150mm lens, it'll set you back £1,349.

11 Olympus M.ZUIKO ED 8mm f/1.8 Fisheye PRO

£799 www.olympus.co.uk

Say hello to the world's brightest fisheye lens for Micro Four Thirds users. Incorporating 17 elements in 15 groups, it's a lens that's ideal for unique, quirky panoramas, sports, action and close-ups taken from the widest of angles.

12 Eve Arnold Monograph

£29.99 Published by Prestel

This first volume in a new series that traces the lives of the most celebrated Magnum photographers turns its eye to Eve Arnold, one of photography's most famous icons.

8



9



7



10



11



12



7 Fujifilm XF 90mm f/2 R LM WR

£699 www.fujifilm.co.uk

Launched beside the X-T10 and claimed to be the sharpest lens in Fujifilm's XF lens range, this new optic incorporates three extra-low dispersion elements to reduce chromatic aberrations and is weather and dust resistant.

8 Canon EF 50mm f/1.8 STM

£129 www.canon.co.uk

This redesigned version of the EF 50mm f/1.8 II promises an improved build quality as well as a smoother and quieter AF performance.



Apple Watch

STORE.APPLE.COM FROM £299.99

The much-hyped Apple Watch is now among us, but is it worth all of the furore? The Apple Watch comes in three flavours and in two sizes, with prices starting at a quite expensive £299.99 and climbing steeply to the breathtakingly

dizzy heights of £13,000.

It's certainly the most stylish-looking smartwatch on the market, but the Apple Watch doesn't offer much more than anything else we've seen before. The Apple Watch pairs to iPhones (5 or later) via Wi-fi and

aims to reduce the need for taking phones out of pockets. This is because you can send/receive messages and notifications all on the watch's retina touchscreen, as well as use apps, such as Apple Maps and Digital touch.

Accelerometers and the watch's heartbeat sensor help to keep track of your activity, even if you're not exercising. If you've been too sedentary the watch will vibrate and tell you to get up and be active for a minute. This and other neat little tricks make the Apple Watch quite fun, but the battery needs charging daily and the features don't solve any genuine problems. At least not yet. But unless you opt for the cheapest option, the price of it just seems a little too extreme. If money isn't an issue, then go for it! However, be aware that you're paying for style over substance. **JD**



Composure Collection by Rest

[HTTP://GETREST.CO/](http://getrest.co/)
\$68 PER ATTACHMENT

This luxury accessory is one for any of you who like the look of the Apple Watch and can't resist. It isn't a 'must-have' purchase, but the Composure Collection by Rest is simply beautiful.

Crafted from premium-grade walnut and lined with sustainable soft cork inlays, the Composure Collection provides an orderly platform for laying your phone, Apple Watch, keys and change when you get home in the evening.

Its organic construction hides some great technical solutions. Magnetic walls connect each compartment, making them customisable while keeping everything firmly together. But the compartments also have some strategically placed holes in them to allow for charging connectors to be kept mostly out of sight. You don't need it, but you want it, don't you? **JD**

SideKick360

WWW.MEFOTO.COM £30

MeFoto makes some great camera supports that deliver on both style and function. In recognition of how capable smartphone cameras are these days, MeFoto also has the SideKick360 in its range. This is a stand-cum-tripod adapter for smartphones measuring 58-78mm in width.

The stand is made from anodised metal and is available in 12 colours, but the best thing about it is that it features a

360° rotating ballhead joint that allows free movement of the phone once fixed.

It can be kept firmly in position without much effort but the free-moving ball head makes it easy to adjust shooting position

quickly. The stand also features an Arca Swiss style base with three 1/4in threads and a single 3/8in screw thread so it can be securely fixed to a range of tripods stands. This is ideal for taking advantage of slow shutter speed and time lapse functions on smartphones. **JD**

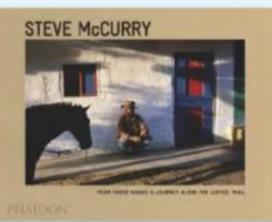


BOOK REVIEWS

FROM THESE HANDS

A Journey Along the Coffee Trail by Steve McCurry
PHAIÐON
£39.95

This latest volume from Steve McCurry features 60 photographs captured

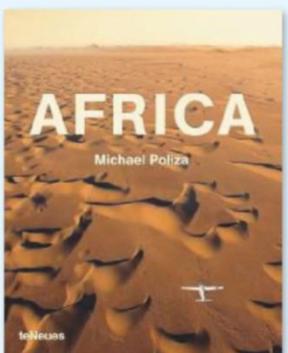


while on assignment to document the lives of the coffee-growing communities found in areas of South America, Ethiopia, Tanzania, India and Vietnam. It's typical of McCurry's work that where many other photographers would create straightforward and dry approaches to the subject, he creates images that can each stand alone as beautiful works of art. As ever, every aspect of the image is exquisitely composed. *From These Hands* is a vital addition to the McCurry canon. **OA**

AFRICA

by Michael Poliza
TENEUS, £45

In this new volume of sweeping sandy vistas and lush Serengeti, Michael Poliza has created a body of work that is very appealing. The reason it works is down to the variety of perspectives. Intimate close-ups of the landscape and animal inhabitants share space with extraordinary aerial shots. As a result the viewer comes away with a fuller understanding of what such a beautiful continent can offer. **It's**



a large book, too, so you might want to invest in some strong shelving. **OA**

SIGMA

With a focal range that covers your everyday needs along with macro functionality, this large aperture, APS-C zoom lens combines superior performance with a conveniently compact form.

C Contemporary

17-70mm F2.8-4 DC MACRO OS HSM

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Compatible with APS-C digital SLRs only

*OS is not included in Sony and Pentax mounts

More on our new product line-up:

sigma-global.com

THINGS TO TRY THIS MONTH





Try this... Remember the rule of thirds

There's a reason why the rule of thirds still plays such an important role in photography – it's because it works. Whatever you're shooting, adhering to the rule of thirds will result in a balanced composition that's pleasing to the eye. In Mark Bauer's image here, the boat is the obvious focal point, but the distant lights also play their part, on the opposite side of the image.

TOP TIP

There's a possibility that this photograph would be rather ordinary if shot in daylight. Waiting until dusk has resulted in a gorgeous, colourful mix of artificial and natural light, while the long exposure has smoothed the water and clouds.
Canon EOS 5D Mark II, 21mm, 179 seconds
@ f/8, ISO 200
www.markbauerphotography.com





Try this... Shoot a picture of your pet

If you have a pet, there's a chance it's so much a part of your everyday life that you forget it can make a great photographic subject, giving you the ideal opportunity to hone your reaction times and action pictures.

TOP TIP

If you have an active dog, specialist dog photographer Rhian White recommends waiting until it's tired after a long walk before attempting to take a portrait of it. Use a ball or treat to get its attention, and go in close with a wideangle lens for a dynamic result.

Nikon D4, 16-35mm at 16mm, 1/400sec @ f/6.3, ISO 400
www.brightondogphotography.co.uk



Try this... Make a still life

When the weather is less than favourable for outdoor photography, try looking for subjects inside to keep you occupied. To construct a successful still life, arrange objects that complement one another – such as the shells and pine leaves in this image by James Robinson – and consider the space created between them (the negative space) as much as where you place them. To give the image a visual balance, James has placed the heavier pieces towards the bottom of the frame, and arranged the twigs so that they point outwards, which gives the upper shells a space to 'sit' within.

TOP TIP

You don't need complex lighting set-ups to shoot a successful still life; natural light from a window (north-facing is best) works equally well. A piece of white card held opposite the main light source will help to balance the exposure, ensuring it is even across the image.

Sony Alpha 200, 55-200mm, 1/200sec @ f/5, ISO 100
www.jamesrobinsonarena.com



Focal length: 600mm · Exposure: F/7.1, 1/800 sec · ISO 800

One step beyond.

SP 150-600mm F/5-6.3 Di VC USD

Zoom up to 600mm for images that soar.

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- VC (Vibration Compensation) for sharp images even under low light conditions
- Moisture-resistant construction

For Canon, Nikon, Sony**

* The Sony mount does not include the VC image stabilizer (150-600mm F/5-6.3 Di USD)



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Hotshoe mics

Mics can often be attached to your camera's hotshoe. Although this is convenient, it isn't always the best place to put it

Mic input

Unless you're using a separate digital audio recorder, you'll need a camera with a mic input to achieve good-quality audio with your video

Headphone output

It's important to be able to monitor the quality of the sound you're recording, so a headphone port is a desirable feature

Sound recording

Great picture quality is only half the story when making videos: the sound is at least as important. Here's our guide to the basics of audio recording for videographers

WORDS • NIGEL AATHERTON

Every now and again, a new technology is introduced that revolutionises some aspect of life. When Canon added a video mode to its EOS 5D Mk II in 2008, the company had little understanding of the significance of this seemingly minor feature, and how it would change the world. Photographers, on the whole, were somewhat ambivalent, but to the film and video industry it was a game-changer. Here was a large-sensor camera that could produce shallow depth of field and shoot in low light at a fraction of the cost of anything currently available in their own market. Suddenly, the 5D Mk II was being used to shoot TV shows and movies, and the rest of the world caught on to the potential for high-quality video that DSLRs offered. The result has been the

creation of an entirely new industry, with hundreds of companies producing products for DSLR video, and a rapid convergence in the hitherto separate worlds of still and video photography. Photographers are now increasingly moving between both fields, and young photographers in particular are growing up to use both mediums interchangeably.

But there's one area of DSLR video functionality that has been left behind in all the hullabaloo: the sound. The fact is that the built-in microphones fitted to DSLRs and Compact System Cameras are fine for short personal clips of your holidays, or the kids playing in the garden – the types of subject where the camera operator is also likely to be the narrator – but for anything more professional, the quality is

woefully inadequate. Good sound quality is equally important to good picture quality, if not more so. You can disguise less than perfect pictures with great sound, but not the other way round – great images will be ruined by poor audio.

For anyone looking to take video seriously, the first investment, after the camera itself, should be a microphone, and if you're buying a camera with video in mind, you should make sure it has an input to accept one. Over the next few pages we look at the factors to consider when recording audio on your camera, and the options available to help you get the best results. Our assumption is that you will be wanting to record a human voice in your videos, but even if you only wish to record, say, birdsong, the same principles apply.

The built-in mic

There's a long list of reasons why the built-in mic is a poor choice for recording the sound in your videos. For a start, it's very small – so small that you may not even have noticed where it is. (Look for a cluster of tiny holes on the front of the body.) It's omni-directional, so it picks up sound from all around, not just from the direction of your subject. While it may not be powerful enough to clearly pick out the voice of a subject speaking a few metres away, it's sensitive enough to amplify the sounds in its immediate vicinity, including your breathing, handling the camera, and even the quiet whirring of the lens's AF motor. It's vulnerable to wind noise, too, which records as a loud roar that drowns out any human speech.

These shortcomings can all be cured by using a suitable external microphone – though there are other issues that can't, which we'll come on to later. But which type to choose? There are so many, each of which has its place depending on your needs. Let's take a closer look at the options.

The directional hotshoe mic

Many camera brands, and numerous independent companies, make a simple cardioid microphone that fits into your camera's hotshoe, plugs into the mic input and records the sound coming from whatever is in front of it. You can buy them from well under £100, and they offer stronger sound, less distracting background noise, less handling noise and less wind noise (when used with a suitable windshield).

It still has its drawbacks, however. For the best possible audio quality, the mic should be as close as possible to the sound source, not

JARGON BUSTER

OMNI-DIRECTIONAL: A mic that picks up sound from all directions.

CARDIOID: A mic with a heart-shaped sensitivity pattern biased to the front, with a little from the sides and the least of all from behind.

SUPER-CARDIOID: A mic with a narrow field of sensitivity to the front (with some pick-up at the rear). Shotgun mics are super-cardioid.

XLR: A robust, locking, 3-pin connector interface used in professional audio instead of the 3.5mm mini-jack used by consumer devices.

stuck on the camera. If your subject is anything over two metres away the quality will suffer. The following video demonstrates this. <https://vimeo.com/126358117>

The shotgun mic

The shotgun mic can also be mounted on your hotshoe, using a suitable shock-absorbing cradle, but it's much more directional – you could say it's the telephoto lens of microphones, in that it picks up from a very narrow angle in front, and has a longer range than a basic hotshoe mic. Even so, shotgun mics are most frequently used off the camera, suspended from a boom above the subject, or pointing up from below, out of camera shot. You've probably seen them in behind-the-scenes shots of movie and TV sets. Shotgun mics are usually more expensive than basic on-camera hotshoe mics, but are more versatile.

The lavalier mic

The lav mic, or lapel mic, is a tiny microphone that attaches to the clothing, just below the neck, of the person speaking. Its short range means it picks up crystal clear sound from the person it's attached to, while ignoring more distant sounds. They're available in both omni-directional or directional types, and both wired or wireless varieties. Although you can pick up

“An audio recorder uses better quality, more powerful pre-amplifiers and less compression”



This Rycote shock mount holds the mic and isolates it from any vibration that could cause audio disturbance

a wired lav mic for under £50, your shooting distance is limited by the length of the cable (on average about 6 metres) since the other end of the mic cable plugs directly into the camera. (There is a workaround for this, however, which we'll come on to shortly.) With a wireless lav mic you can shoot from further away and the subject has complete freedom of movement. The downside of lav mics is that they're visible in your video, and the wireless varieties are very expensive for the amateur film maker.

Using a separate audio recorder

So far, all of the solutions presented assume that you're still recording your sound in-camera, but this doesn't have to be the case. In fact, there are many reasons not to. The most obvious is that you may not even have an external mic input to plug a microphone into. Even if you do, the main problem then becomes how you control and monitor the sound. Few cameras currently have manual audio level adjustment, and if they don't, it means they'll use Auto Gain Compensation to automatically adjust the record level (like auto exposure, but for sound). This means that if the ambient noise level in your environment suddenly drops (for example, if someone stops speaking or music stops playing) the camera, suddenly unable to hear anything, starts to panic and cranks up the record level, delivering a sudden whoosh of background hiss. Then, when the sound starts again the level drops suddenly and obviously. It sounds



Professional mics use robust XLR connectors, while DSLRs and CSCs only accept the 3.5mm mini-jacks used by consumer-level mics

pretty amateurish. If your camera does have the means to set a record level, with a meter to provide a visual representation of the audio being recorded, you should use it, setting the peaks of your sound to hit the -12dB level to avoid distortion. Even then, there's no substitute for actually hearing the audio that you're recording so you should ideally be monitoring it through headphones. If your camera has a headphone output, make sure you use it.

So let's say that your camera does have manual audio level control and headphone monitoring – you're good to go, right? Well, yes and no. An audio recorder will still deliver much better sound because it uses better quality, more powerful pre-amplifiers, and less compression. It's a device purpose-built for the job. By not being attached to the camera, it also enables you to get your wired



Shotgun mics are the telephoto lenses of microphones, recording sound from a narrow polar field to the front

microphone much closer to the sound source (the holy grail for good-quality audio). It's no longer an issue that your 6m wired lav mic won't stretch to the camera, for example. The audio recorder can be hidden near the subject, just out of camera shot.

Can't afford an audio recorder?

You can buy a reasonable digital audio recorder for under £100, and an excellent one for not a lot more, but if you're on a tight budget you could also consider the audio recorder you already own: your smartphone. All iPhones and most other devices have a built-in audio recorder which is superior to the one in the camera, and like digital audio recorders they have the benefit of being able to be positioned close to the subject. Use one on a table in front of your speaker, or even slipped discreetly into the shirt pocket (the mic is generally at the bottom of the phone so it will need to be upside down) or plug in a compatible mic (look for one with a TRRS jack). An inexpensive lav mic clipped to the speaker's lapel and plugged into an iPhone in their back pocket will produce much clearer recording than the camera will.

In addition to the built-in audio-recording apps that come with your phone, there are dozens of others, such as Griffin's iTalk, that offer more functionality.

What WDC uses

What Digital Camera started shooting videos of our reviews back in 2007. Our YouTube channel has over 50,000 subscribers and our videos have been viewed more than 26 million times. Although we use a variety of cameras (mostly Canon DSLRs or the Panasonic GH3) our audio recording kit is fairly consistent. It includes:

SENNHEISER EW100 G3: Probably 90% of our videos are shot using this wireless lapel mic, attached to the presenter. We have two sets, one using XLR connections for our audio recorder, and the other fitted with 3.5mm mini-jacks so it can go directly into the camera.

SENNHEISER MKE600 SHOTGUN MIC: For those occasions where a lapel mic isn't suitable, we use this excellent shotgun mic, both on and off the camera, depending on the situation.

RYCOTE ACCESSORIES: To combat wind noise, our mics are fitted with Rycote windshield accessories, including the Softie for our shotgun mic. We also use Rycote's shock mounts, whether handholding or hotshoe-mounting the mic.

TASCAM DR-40: This particular digital audio recorder can accept both XLR or 3.5mm mini-jacks, making it a versatile recorder whichever mic we are using.



We use Sennheiser EW100 radio mics for the vast majority of our own videos

For more videos showing how to shoot better video on your DSLR, see our website, www.thevideomode.com

THE VIDEO MODE



We use this Tascam DR-40 digital audio recorder for most of our own video recording

Audio accessories round-up

When it comes to deciding on your audio-recording accessories, there's a vast choice available, and a round-up such as this can only begin to scratch the surface. We've brought together a representative sample of the types of audio-recording equipment available at different price points, to give you a starting point.

We've covered the main types of microphone that you should consider, three popular digital audio recorders, and examples of some of the additional accessories that should be part of any serious sound recordist's arsenal.

Use this round-up as a starting point to help find the perfect kit to suit your needs and budget.

Microphones



Rode SmartLav+ £60

WWW.RODE.COM

An inexpensive way to achieve high-quality audio recordings is to use your smartphone, and plug a mic into it. Not all mics are compatible, but the wearable Rode SmartLav+ is tailor-made for the job, featuring the required TRRS type jack. Simply clip the mic to the speaker's lapel and plug it into a concealed iPhone or certain Android phones. Control your recording using the dedicated Rode rec app (currently £4.49) or one of numerous free apps. The mic itself is a 4.5mm diameter omni-directional condenser type, which comes with a foam pop filter, and the 1.2m cable is Kevlar reinforced.

KEY SPECS

POLAR PATTERN	Omni-directional
FREQUENCY RANGE	20Hz-20kHz
SENSITIVITY	-35.0dB (17.80mV)
MAXIMUM SPL	110dB SPL
DIMENSIONS	1180 x 4.5 x 4.5mm
WEIGHT	6.0g



Rode VideoMic with Rycote Lyre £90

WWW.RODE.COM

The Rode VideoMic is one of the most popular budget camera-mounted shotgun mics. Employing a highly directional super-cardioid polar pattern, the VideoMic also features a selectable high-pass filter to reduce sensitivity to low-end noise such as air conditioners and traffic, while the integrated Rycote Lyre shock mount is constructed from a single piece of thermoplastic and isolates the mic from external physical factors that may cause unwanted vibrations. A selectable -10dB and -20dB level allows better recording of loud sound sources, such as live music or motorsport.

KEY SPECS

POLAR PATTERN	Super-cardioid
FREQUENCY RANGE	40Hz-20kHz
SENSITIVITY	-38.0dB (12.60mV)
MAXIMUM SPL	134dB SPL
DIMENSIONS	65 x 102 x 250mm
WEIGHT	176g



Azden SMX-10 £100

WWW.AZDEN.COM

Azden is an up-and-coming Japanese brand that has been impressing reviewers with models such as the sub-£100 SMX-10, which is designed specifically for DSLRs and is the company's best-selling video mic in the UK. It's a dual uni-directional, electret-condenser mic powered by a single AAA battery, and features a switchable low-cut filter to cut out low-frequency background noise. It comes with a windshield and a basic shock mount, but is also compatible with the superior Rycote versions if you want to upgrade. A broadcast-quality version of this mic, the SGM-DSLR, is also available for £200.

KEY SPECS

POLAR PATTERN	Super-cardioid
FREQUENCY RANGE	100Hz-20kHz
SENSITIVITY	-40.0dB
MAXIMUM SPL	100dB SPL
DIMENSIONS	18.2 x 177mm
WEIGHT	52g



Sennheiser MKE600 £299

WWW.EN-UK.SENNHEISER.COM

You may know Sennheiser for its high-quality headphones, but this German company is also the market leader in broadcast-level video mics. The MKE is not the base model in Sennheiser's range, but it's a much more professional model than the entry-level MKE-400. Within its rugged all-metal housing is a highly sensitive super-cardioid pick-up with maximum rejection of side noise and a low-cut filter to minimise wind and low-frequency noise. It uses the professional XLR-type connector, but is available in a kit with an XLR-to-3.5mm mini-jack adaptor cable for plugging directly into the DSLRs.

KEY SPECS

POLAR PATTERN	Super-cardioid
FREQUENCY RANGE	40Hz-20kHz
SENSITIVITY	21mV
MAXIMUM SPL	132dB SPL
DIMENSIONS	256 x 20mm
WEIGHT	128g



Sennheiser EW 100 ENG G3 £800

WWW.EN-UK.SENNHEISER.COM

If you're looking to take video seriously, you should consider having one of Sennheiser's Evolution wireless kits in your arsenal. At the heart of the kit is a transmitter unit, into which you plug your mic, and a receiver unit which plugs into your camera or audio recording equipment. The ME-2 clip-on lavalier mic can be attached to the presenter, or you can attach the plug-in transmitter to a reporter or shotgun mic (such as the MKE600). The Evolution series is available in a variety of kit configurations and there's a wide range of available accessories, with a choice of XLR or mini-jack connectors.

KEY SPECS

POLAR PATTERN	Omni-directional
FREQUENCY RANGE	80Hz-18kHz
SENSITIVITY	20mV
MAXIMUM SPL	130dB SPL
DIMENSIONS	256 x 20mm
WEIGHT	128g

Digital audio recorders



Tascam DR-40 £160

WWW.TASCAM.COM

The DR-40 offers four-track recording from two built-in, high-quality, condenser microphones, which can be swivelled to different angles so you can tailor your recording to the situation. In addition, it also accepts external mics via XLR or line inputs. A pair of powerful preamps delivers high-quality sound, while the simple user interface and large clear LCD display enable easy setting and monitoring of your recordings, which can be saved onto SD cards up to 32GB and transferred to your PC using the USB 2.0 jack. Other features include an overdub mode, variable speed playback, limiting and low cut filter.

KEY SPECS

RECORDING MEDIA	SD /SDHC
FILE FORMAT	WAV, BWF, MP3
REC BIT RATE	32-320kbps
CHANNELS	4-channel
DIMENSIONS	70 x 155 x 35mm
WEIGHT	213g



Zoom H4n £170

WWW.ZOOM.CO.JP

Zoom is one of the market leaders in digital audio recorders and makes a range of models, of which the H4n is an industry standard. Equipped with two built-in X/Y mics that can be set to a 90° or 120° pattern to suit the subject, external mics can be connected using a choice of XLR or mini-jack inputs. The digitally controlled, high-quality preamplifier delivers excellent sound across up to four channels, while other advanced features include time stamping and track markers, on-board editing, pitch control, and 11-hour battery. There's even an optional remote control.

KEY SPECS

RECORDING MEDIA	SD /SDHC
FILE FORMAT	WAV, PCM, MP3
REC BIT RATE	48-320kbps
CHANNELS	4-channel
DIMENSIONS	70 x 156 x 35mm
WEIGHT	280g



Tascam DR-70D £270

WWW.TASCAM.COM

If you want a recorder that you can attach neatly to the bottom of your DSLR, then look no further than the Tascam DR-70D, which screws into your camera's tripod thread, while a second thread enables it to be fixed to a tripod. A pair of built-in mics are supplemented by four XLR sockets for external mics. Each input has a limiter and low cut filter available for controlling volume. Also included is Dual Recording mode, which records a safety copy of your audio at a lower level to prevent distorted takes. The DR-70D records to SD and also features a headphone input for audio monitoring.

KEY SPECS

RECORDING MEDIA	SD /SDHC
FILE FORMAT	WAV, BWF
REC BIT RATE	32-320kbps
CHANNELS	4-channel
DIMENSIONS	169 x 55 x 106mm
WEIGHT	625g

Additional accessories



Windshields

WWW.RYCOTE.COM

If you're shooting outdoors, it's essential to have a decent windshield to reduce the effect of wind noise. Most mics come with a windshield, but these free ones are of limited effectiveness. Rycote is the market leader in this area, and makes a wide variety of types for both microphones and digital recorders but the Softie, used by the likes of Philip Bloom, is one of the biggest sellers. Made from open-cell foam and covered with a synthetic fur, the softie is available in a range of sizes from 5cm right up to 32cm.



Shock mounts

WWW.RYCOTE.COM

A shock mount is a cradle that supports a mic and isolates it from any movement or vibration that could be picked up and potentially spoil the recording. Think of it as a Steadicam for your mic. You can get shock mounts to fit on hotshoes, boom poles, pistol-grip handles for hand-holding, and for external audio recorders. Again, Rycote dominates this market and makes a wide variety. Its InVideo suspension mount is a versatile option for hotshoe mounting, while its Portable Recorder Suspension mount is perfect for external audio recorders.



Other accessories

WWW.RYCOTE.COM

You may find that you have both a mic (or external recorder) and an LED light, and want to fit both to the camera's hotshoe. The Rycote Hotshoe Extender is a bar that fits into your hotshoe and lets you attach several accessories into it at the same time. If you have the luxury of an assistant to help you, placing a shotgun mic on a boom pole and suspending it above or below the subject, just out of shot, is the favoured solution used by the pros. It also offers the benefit of no lav mics being visible in shot. Boom poles are available from under £50.

Jean-Claude Castor

BERLIN, GERMANY

I bought my first DSLR – a Nikon D5100 – in 2011, and carried it with me at all times, mainly shooting street scenes and architecture in Berlin, where I've lived for eight years.

In 2014, I started travelling, at which point I upgraded to the D7100. Travelling has provided me with an endless source of inspiration, from experiencing cultures that are new to me, to capturing both city and landscapes. When at home, I concentrate on my skyline project, which I shoot from the rooftops of Berlin.

I use a nodal point adapter when shooting panoramics, then merge the files in Photoshop. I always shoot Raw, editing the images in Lightroom afterwards. I nearly always shoot during either the blue or golden hours, and if I encounter a tricky lighting situation, I use digital blending to overcome it.

Although the D7100 is the perfect travel companion, I would love to upgrade to a full-frame Nikon D810 eventually. That, and make my living from being a full-time photographer.

Maybe one day!



WWW.FLICKR.COM/CLAUDECASTOR

JEAN-CLAUDE USES A

Nikon D7100



The Nikon D7100 is light, which makes it ideal for travelling. Initially, I made most of my panoramic images with the 18-55mm kit lens that came with the camera. Now, I use the Sigma 10-20mm, Sigma 35mm f/1.4 Art lens, Sigma 70-200mm f/2.8 EX DG OS HSM and Nikkor 60mm f/2.8 Macro. I use the Manfrotto 055 Pro 3 tripod with a Novoflex Slim NPA.

1



1 German horseshoe bend, near Orscholz

This photograph is two panoramics – each made up of seven images – stacked on top of each other. I took it early, at 4.30am one morning.

18-55mm at 18mm, 1/2sec @ f/8, ISO 100

2



2 Podere Belvedere, Val d'Orcia, Tuscany

Thousands of great pictures of this scene exist on the internet. Each one is different, due to the changing conditions and the times of day at which they are shot. I could have stayed in this spot for weeks, and I think everyone should go there at least once in their life!

60mm, 1/500sec @ f/8, ISO 100

3 Dubai skyline

This is an iconic view of the Dubai skyline, for good reason. It shows the tallest building in the world and the huge Sheikh Zayed Road in one picture. I took five separate images to make the panorama.

10-20mm at 10mm, 5 seconds @ f/11, ISO 100

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Shooting Portraiture on the EOS 5D Mark III

Anyone who takes people pictures knows that avoiding pitfalls isn't easy. We'll show you how to set up the 5D Mark III correctly, to help you improve your images

WORDS AND PICTURES
TOM CALTON



Portrait photography is an incredibly powerful photographic medium. As humans, we instinctively connect with portraiture on an psychological level, which means a single still image has the power to evoke a wealth of different feelings and emotions – more so than any other medium, it could be argued. What's more, with so much variation in size, shape, and colour between subjects, no two portrait photographs will ever look the same, and I believe that's what makes it such an exciting and rewarding subject to document. However, in order to take stunning portraits, you're going to need to make sure that you have the right camera and lenses for the job.

The Canon 5D Mark III is a superb choice for portrait photography, for a number of reasons. Firstly, at the heart of the camera it houses a 22.3 megapixel, full-frame sensor that captures images with an incredible amount of detail and vibrant colours. Its much larger chip also means that the camera is ultimately able to handle digital noise much better than its smaller APS-C sized siblings.

This particularly pays dividends when shooting in tricky low-light situations, such as a church weddings, as it means you can comfortably boost the ISO setting to a higher sensitivity without as much fear of grain and coloured speckling plaguing your shots.

Its casing is made from a hardwearing magnesium-alloy body, which allows it to stand up to the wear and tear of busy photography work, while a series of internal weather seals means that its delicate innards are well protected from the likes of rain and dust.

Over the next couple of pages, we'll be exploring how to set up the EOS 5D Mark III correctly for portraiture and reveal the best lenses you can pair it with in order to capture some stunning people pictures.

Composition and focusing

The Canon 5D Mark III offers an impressive 61-point AF system; 41 of those points are the more accurate cross-type points, with five dual cross-type) that cover over 50% of the frame. The main advantage of this is that not only does the 5D Mark III offer incredibly accurate autofocus, but thanks to the

camera's plentiful spread of AF points across the viewfinder, it's really easy to achieve focus on your subject, no matter where they're situated within the frame.

Pressing the camera's AF Point Selection button, located to the top right of the thumb rest, you're granted access to the 5D Mark III's array of AF grouping modes. When shooting full-length portraits, I usually opt for the 'Expand AF Area: Surround' option, which makes the selected AF point, and the surrounding eight AF points active. I've found that this gives the camera a much better chance of being able to quickly and accurately latch on to my subject, reducing the chances of it hunting.

Alternatively, if I were to shoot a close-up head shot with a shallow depth-of-field (at f/1.4 for example), I tend to switch over to the 'Spot AF' mode, as this reduces the active AF point to just half of its regular size. The idea here is that by using such a small surface area, it's much easier to set the focus on the model's eyes, and avoiding accidentally focusing on the tips of the eyelashes, which can be enough to ruin the shot entirely.

Exposure and compensation

I tend to favour Aperture Priority mode over any other shooting mode on the 5D Mark III. The reason for this is that, of the exposure triangle (aperture, shutter speed and ISO), the aperture value is arguably the most important setting for portraits.



IMAGE BY PHIL HALL © MODEL FROM WWW.MISSIONMODELS.COM

For head and shoulder or full-length portraits, try using the Expand AF Area: Surround option to ensure the selected AF point and surrounding AF points are active

Most of the time, I like to shoot using a wide aperture (around f/2 if the lens allows it) as I like to throw the background and foreground of the image out to a pleasing blur, which really helps to draw the focus on to the subject. Aperture Priority mode allows me to set the aperture, while the camera determines a suitable shutter speed, which in turn frees me up to focus on what is most important – focusing, composing and bagging the shot. While looking through the

“The 5D Mark III’s full-frame sensor deals with noise very well, so you can comfortably shoot at higher ISOs”

viewfinder, I occasionally flit my eye across to the shutter speed value to ensure that it hasn't dropped too low.

If the shutter speed does start to slow too much, I simply increase the ISO level to compensate. Although the 5D Mark III is superb at controlling levels of digital noise, even at higher ISOs, I always do my best to keep the ISO as low as possible in order to maximise image quality.

Once I've taken a few shots, I review the images on the back of the screen by pressing the Playback button, and then use the histogram (activated by pressing the Info button a few times) to ensure that the image hasn't been overexposed and lost any detail in the highlights.

Lenses

Personally I have a bit of a passion for prime lenses, and I currently find myself switching between my Sigma 35mm f/1.4 and Canon 85mm f/1.8 for the bulk of my portrait photography – the 35mm for full-length shots, and the 85mm for head shots. I love prime lenses for a number of reasons; firstly, they offer a much wider maximum aperture than most zoom lenses. With maximum f/stops of around f/1.4 and

Step by step

Setting up your **Canon EOS 5D Mk III** for stunning portrait images

STEP 1



ATTACH A PORTRAIT LENS First off it's important to think about the kind of portrait you're trying to achieve and then choose a suitable lens for the job. For a nice blurred background you'll want to use a lens that has a fast maximum aperture, such as a prime lens or a fast zoom. It's also a good idea to use a mid to long telephoto lens as using a wideangle will distort your subject's features for displeasing results.

STEP 2



SWITCH TO APERTURE PRIORITY Start off by turning the mode dial to Aperture Priority (Av) – this will allow you to set the aperture value, while the camera takes care of the shutter speed. Dial in a wide aperture – preferably f/2 or wider if you're using a prime lens – as this will allow you to achieve a pleasing shallow depth-of-field. Remember that a wide aperture requires you to focus very carefully on the eyes.

f/1.8 (and even wider on some high-end lenses), not only does this let in a ton of light, allowing you to keep your ISO as low as possible for better image quality, but it also allows you to create beautiful shallow depth-of-field effects, which just work superbly with portraits. Generally speaking, prime lenses tend to be sharper than zooms, too, because their innards have been specifically fine-tuned to that focal range, rather than having to adapt to multiple focal lengths like a zoom lens.

The downside, of course, is that you're fixed at a certain focal length, which can sometimes become limiting – particularly when shooting events such as weddings where you need to act fast in order to catch the shot. In situations such as this, I tend to play it safe and opt for my Canon 24-70mm f/2.8 lens. Although the maximum aperture of this lens isn't quite as wide as that of my primes, it's still much wider than most standard zoom lenses, which are only able to open up to around f/4 or f/5.6.

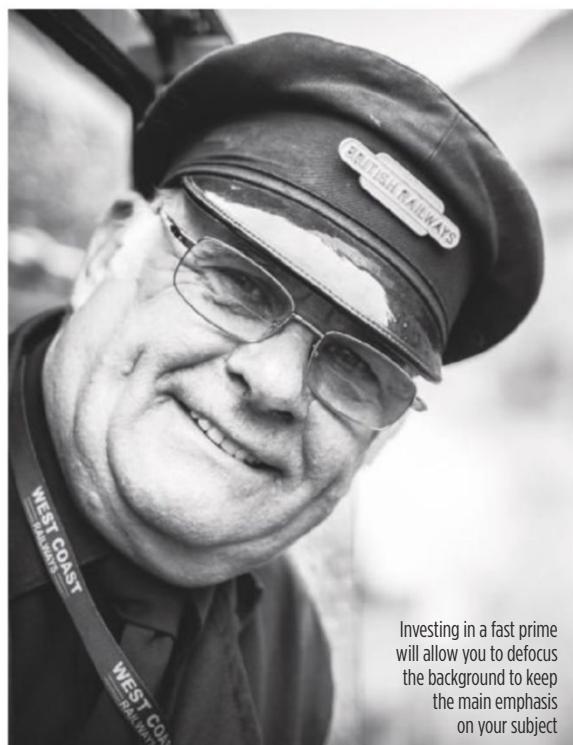
Out in the field

I find that the 5D Mark III really comes into its own when placed in a fast-paced, high-pressure situation, such as a wedding. Weddings can be notoriously tricky affairs to shoot as not only are you required to think and act fast in order to capture the day as it unfolds, but you're often faced with tricky lighting situations where you simply have to deal with what is in front of you or run the risk of missing the shot entirely. This is very often the

Essential accessories

If I were to pick one downside to the 5D Mark III, it would have to be its weight. It's fair to say it's not the lightest camera in the world, especially when kitted with a heavy zoom lens, so ensuring that I have a comfortable harness system to support this load when it's not in use is paramount. Personally, I'm a fan of Black Rapid's Double DR-1 (£114) harness system; this clever and comfortable body support

allows me to comfortably carry two DSLRs at my side, while also granting quick access to them without having to detach or unclasp the cameras from the security of the harness. The weight of the cameras is spread evenly across the shoulder and back to reduce strain, and the harness can also be configured into a single strap, too, for days where you only want to use a single body.



Investing in a fast prime will allow you to defocus the background to keep the main emphasis on your subject

case at church weddings, where natural light is usually at a minimum, so boosting the camera's ISO to a high sensitivity is often essential to getting the shot. Luckily, the 5D Mark III's full frame sensor deals with digital noise incredibly well, allowing you to comfortably shoot at higher ISOs.

The camera's DIGIC 5+ processor also helps to aid a continuous burst shooting mode of 6fps, meaning that you can rattle off multiple shots in quick succession in order to better your chances of bagging a great shot.

Not only does the 5D Mark III perform to a pro standard, it also looks the part, too. I've often had comments such as 'Wow! That looks like a serious piece of kit!'. It sounds strange, but I do believe this is actually an important quality of the camera, as it helps to reinforce your professional demeanor, and I've found that this in turn makes the client feel more comfortable receiving your guidance and instructions.

STEP 3



STEP 4



STEP 5

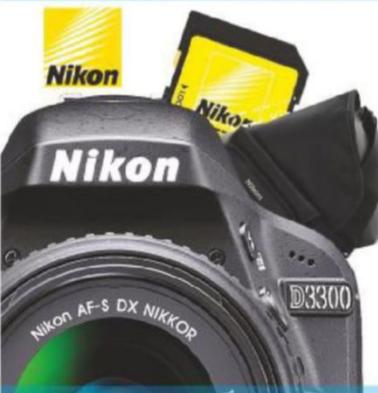


SET THE AF POINT Press the AF Point Selection button, top left of the rear thumb rest. If you're shooting a standard portrait, press the M-Fn button (just above the shutter button) to cycle through the AF grouping modes until you get to 'Expand AF Area: Surround' – this'll give you a larger active AF area to help in achieving sharp focus on your subject. If you're shooting a close-up headshot, choose Spot AF instead.

ACTIVATE DIRECT AF POINT CONTROL Press the Menu button, then cycle through until you reach the second menu set within the Custom Functions (orange menus). Choose the Custom Controls option and then select the joystick – set it to AF Point Direct Selection and hit the Set button to confirm. Press the Menu button a few times to back out. Now you can control the location of the active AF point via the joystick.

COMPOSE, FOCUS AND SHOOT

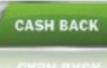
While looking through the viewfinder, compose the shot, then using the joystick, move the active AF point so it is hovering over the subject's face (or eye if you're shooting a close-up head shot). Half depress the shutter button to lock focus, then fully depress it to take the shot. Press the Playback button to review the image on screen and check it's correctly exposed.

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18-55mm VR

Lens Kit

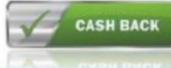
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Lens Kit

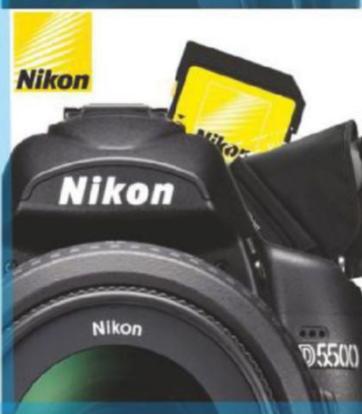
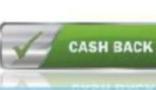
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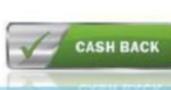
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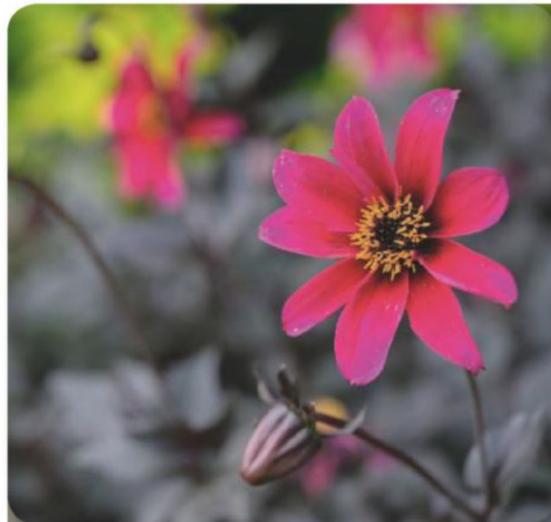
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Getting the most from Nikon Picture Control settings

While most of us rely on computer programs to enhance our images, it's also possible to make alterations at the shooting stage, as our guide explains

WORDS AND PICTURES **NEIL FREEMAN**

The Nikon Picture Control system enables you to easily control the appearance of your images. It is a powerful setting, and once you have experimented with it and are able to observe how using it can influence the atmosphere of your pictures and movies, you will see that there are endless opportunities to create your own personal image styles to suit your taste.

If you want, you can even replicate the look of specific film emulsions. For those of us old enough to remember the days of film, this opens up a world of creative opportunities. We are now in a position to 'load' a picture control setting and take control of the colour hues, saturation, sharpness and

contrast to create a particular 'film' look in any image.

Picture control is not just limited to still images, you can also customise the look of the movies you shoot with your Nikon DSLR.

You can also name and save custom picture control settings as new menu items and then quickly call them up via the menu system when you need that particular look.

Choosing the 'look' you want

Depending on which Nikon digital camera you own, you will have a number of picture controls settings. These include Standard, Neutral, Vivid and Monochrome. Some Nikon DSLRs also have an expanded range of

picture controls which add Flat, Portrait and Landscape, too.

The different picture control settings give you the choice to change the look of your image and, if you want to go further, Standard, Neutral, Vivid, Portrait and Landscape allow for further adjustments to sharpening, contrast, brightness, saturation, and hue (coloration). Monochrome allows for adjustments to sharpening, contrast, brightness, filter effects and toning.

To change the picture controls, press Menu and then under the shooting menu, highlight Set Picture Control and press OK. Then you simply choose a picture control from the selection available on the menu, and press OK (see box on page 30).

The 'Vivid' setting adds punch to this image of a flower, increasing saturation and making the colours really pop

Basic picture controls and what they do

Standard

Suitable for portraits, landscapes and just about any other type of photograph. As expected, Standard picture control gives you normal-looking, balanced images. This is the default setting for picture control.

Neutral

Delivers images that are closest to the original scene. To reproduce the subject's unique colours and gradations with authenticity, avoiding extreme enhancements. Gives a smoother overall impression than Standard.

Vivid

For distinct, colourful, fresh-looking images with just the right emphasis on your

subject's contrast and sharpening. Compared with Standard, Vivid gives a more 'punchy' overall impression. It's ideal for situations where you wish to emphasise primary colours, such as colourful fashions, city streets, fresh fruits and floral arrangements.

Monochrome

Gives you monochromatic shadings, such as black-and-white or sepia. You can also select Filter Effects, to create the kind of results you get when shooting with a colour filter for black-and-white photographs. You can then further 'tone' the images to adjust the overall look of images in a way that formerly required working in a darkroom with photographic paper.

Additional picture controls

Flat, Portrait and Landscape are additional picture controls that may be available on your Nikon DSLR. These give you further opportunities to customise the appearance of your image.



Customising picture control settings

Whichever picture control you choose, you can further customise the look and atmosphere of the setting in order to create your own bespoke control. To do this, under the shooting menu, highlight Set Picture Control and press OK. Now, from the selection on the menu, choose a picture control and press the right arrow on the multiselector. This now enables you to customise any of the following settings to create your own personal look to your images.

Sharpening

Sharpening enables you to alter the strength of your subject's contours, starting from 0 (no sharpening) to 9 (maximum sharpness). You can also set the camera to A (auto), where it makes adjustments automatically to

match shooting conditions. The lower the number, the softer your image will be; the higher the number, the sharper the image.

Clarity

Clarity is a new addition to the latest Nikon DSLRs. The level of clarity from -5 to +5 can be selected as well as A (auto), so that the camera automatically adjusts the clarity according to each shooting situation.

Clarity is useful when you want to make hazy-looking subjects appear clear, while maintaining detail, or when you want to make hard-looking subjects appear softer and gentler. Effectively, the lower the number, the softer the image and the higher the value, the clearer the image becomes.

It's worth noting that while sharpening mainly controls the contours of a subject, clarity can



At -5, an already soft image appears as if a stocking has been placed over the lens. The 0 setting shows the image as it would normally appear, while +5 increases overall definition

control the subject's clearness. At the same time, it maintains the gradation of highlight and shadow areas.

Also, if you control contrast, the brightness of highlight and shadow areas may be affected, but with clarity, the brightness of the original subject will be largely unchanged.

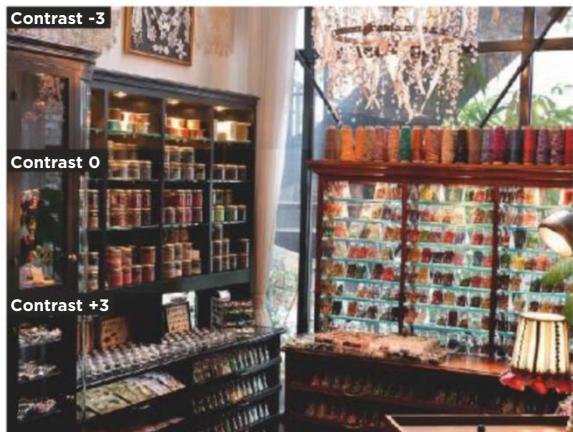
Contrast

It is possible to fine tune the contrast of your images from -3 to +3. You can also set the camera to A (auto), where it makes adjustments automatically to suit the shooting conditions. When set to the minus side, the image appears softer. When set on the plus side, the image becomes harder. A minus setting is recommended when shooting portraits in bright daylight, or if there's a danger of highlights being overblown. A plus setting is suitable if, for example, you're shooting a distant subject covered with mist. If you want to achieve a nostalgic-

Step by step

Managing Custom Picture Controls

So you have now created your custom look for your images. You can save the settings of your personal adjustments in Picture Control, so that you can access them again easily. This is done with the Manage Picture Control settings in the shooting menu. For example, if you have created a picture control that gives a look such as 'Portraits with a gentle atmosphere in bright sunshine' and you intend to use the same setting again in a similar situation, you can register the setting and save it in the camera. You can save up to nine custom Picture Controls, depending on which DSLR you own.



looking image with a soft and gentle atmosphere, use a weaker setting. When you require clear and crisp images, make it stronger.

Brightness

The overall brightness of your image can be adjusted from -1.5 to +1.5.

When set to the minus side, contrast is enhanced within the highlight areas, while the mid-tones (areas other than highlight and shadow) are darkened. When set towards the plus side, the scene can be rendered brighter, while maintaining detail in the highlight areas. This is a particularly useful setting on occasions when exposure compensation may result in washed-out highlight areas.

“A minus contrast setting is ideal when shooting portraits in bright daylight, or if there’s a chance highlights may blow”

Softer contrast is the result at -3, with colours appearing muted. At 0, they are more ‘normal’, while at +3 the colours are denser

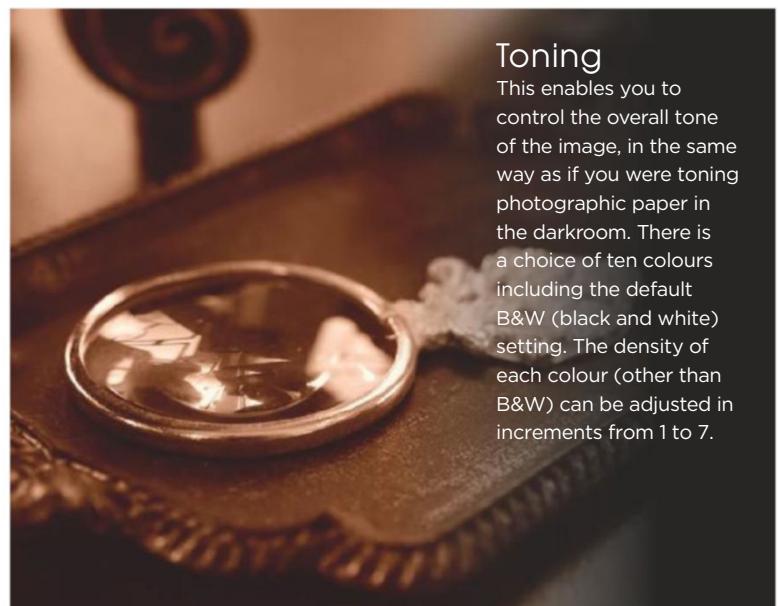
Saturation

It is possible to control the saturation of colour images from -3 to +3. You can also set the camera to A (auto), where it makes adjustments automatically to suit the conditions in which you are shooting. Moving toward the minus side results in a reduction in colour brightness, while moving toward the plus side imparts a deeper brilliance to the colours.

Hue (a setting that is not available in monochrome) allows you to adjust the hue of images from -3 to +3. In effect, this is the colouration of the various shades that make up an image. In terms of skin tones, the minus side increases reddishness, while the plus side enhances more yellow tones.

Monochrome effects

Monochrome filters provide an effect that is similar to shooting black-and-white photographs with a colour filter. Y (yellow), O (orange) and R (red) effectively emphasise the contrast of your image, with Yellow providing the most subtle effect, and Red being the strongest. This is a particularly useful setting when you want to decrease the brightness of the sky to make the scene appear deeper and denser. G (green) provides a similar effect to shooting black-and-white photographs with a green filter, making some areas of an image appear deeper and denser. This can make the skin tone or lips look subdued, which is effective for portrait photography.



STEP 1



Edit the parameters outlined above based on a built-in Picture Control. Now select Manage Picture Control

STEP 2



Choose Save/edit.

STEP 3



Select the picture control you wish to customise.

STEP 4



Press right on the multi-selector to access the Picture Control custom settings page.

STEP 5



Move the sliders until you have the settings you require and press OK. You can now choose which custom setting bank and the name you wish to use for your custom picture control.

STEP 6



After saving your custom picture control, all you need to do is select it and shoot.

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FROM **Amateur
Photographer**

How to shoot 4K photo

With a setting that allows you to shoot video, then extract an 8MB image from it, could 4K photo be the best of both worlds?

WORDS AND PICTURES
ROSS GRIEVE



You've probably only recently heard of 4K photo. You may be one step ahead of most people and embracing it already. Alternatively, you might be reading this and wondering what on earth it is.

To me, it's another form of technological progression. When digital was first introduced, I was hooked on film and was quite slow to make the transition. I learnt my lesson very quickly, that I needed to embrace new technology in the industry as it happened. Hence my wholehearted approval of 4K photo.

But what is 4K photo? For me, it's an exciting new way to take photographs. It's not cheating (although, needless to say, some might disagree) – it's simply another tool in the photographer's armoury,

one that can make our jobs or hobbies more efficient. 4K photo is a single frame grab that is taken from 4K video footage. This allows you to take an 8.3MB still from the video that can be printed up to A3 with outstanding detail.

To give you an idea of the quality involved, 4K video on a Panasonic Lumix GH4 films at 30 frames per second and is four times better quality than HD. 4K photo can be used in all aspects of photography, such as portraiture, street photography (as it's discreet) and at weddings – there are no limits. But where it really comes into its own is when you want to avoid shutter noise. This is particularly significant for wildlife photography, as it means you won't startle the animal you've been waiting hours for. In terms of

When shooting 4K video on the Panasonic Lumix GH4, you can extract an 8MB still to create a JPEG file, allowing you to capture the nuances of a model's movement and expression

sports photography, it opens up new avenues when you're working at events such as golf and snooker, where photos are not permitted until the player has taken their shot. Wedding photographers can set up a camera in the church to film in 4K, then select the images later. It's like having an additional photographer, but without the extra wages!

How to shoot 4K photo

There are two ways of approaching filming in 4K. Firstly, as a filmmaker or videographer who is filming video for themselves or their client, and who knows he or she can pull a frame at a later stage to make artwork for a DVD cover or packaging. Remember this is a frame grab, which is entirely different to a screen grab. Secondly, as a photographer who is filming in

4K purely to achieve the end result of a photograph.

Think of the 4K video footage as your Raw file, from which you can produce an 8.3MB JPEG. The huge bonus from a photographer's point of view is that they can exploit the features that normally only a filmmaker would benefit from. I don't know of any stills cameras that can shoot at 30 frames per second, but the GH4 does in 4K photo mode. So I can film for ten seconds and have 300 frames to choose from. I can then view on the back of the camera and select the frame I like and save it as a JPEG, or I can choose the frame later on my computer if I want to carry out any editing on the photo. Another noteworthy feature is focus peaking. This is used when focusing in manual mode, and highlights the parts of the image that are in focus with a bright colour.

One of the concerns people have

Choosing the best frame – in this case, when surfer and wave come together at the perfect moment – is exactly the same as scrolling through a series of individual images

Tethering and uploading

Tethering your camera to a screen such as your laptop is useful for studying the image in more detail. It is easily achieved with the Panasonic Image app (free to download), which allows you to view and control your camera wirelessly from devices such as an iPad or iPhone. Because the GH4 has its own built in Wi-fi, you can be in the middle of nowhere and still view or control the camera remotely. The app also allows you

to transfer images directly from the camera to your device, which is useful for uploading pictures to websites or simply backing them up immediately. This makes your working kit light and transportable. For example, using the built in Wi-fi and the app, you can put your camera in the garden and film from the comfort of your kitchen while the wildlife carries on with its day and isn't startled by the sound of a camera shutter.

"I find the most efficient way to shoot 4K photos is to film in bursts of no more than 10-15 seconds"

when they learn about 4K photo is the amount of card space all that high-quality footage is going to use up. Because I find the most efficient way to shoot 4K photos is to film in bursts of no more than 10-15 seconds, I never worry about filling up SD cards. To put it into perspective, about one minute of 4K filming will



Step by step

Setting up the **Lumix GH4** to shoot 4K photo

STEP 1



Firstly, your firmware should be up to date. Turn your camera on and switch your camera to Movie mode on the top dial, then press the menu button. You will then see in the top left-hand corner, a red video camera icon.

STEP 2



Once in the Motion Picture menu, you will see several options. Scroll through until you see 4K Photo. If 4K Photo is off, turn it on. You will notice your Rec Format change to MP4 if you were filming in another format.

use 1GB of your card. That's 1,800 potential photos in a minute. Most of the time, I capture the images I want in four or five seconds of filming.

The GH4 features a setting known as Loop Recording. This allows the user to keep filming and not replace their SD card, as once the card is full, the camera records over the oldest content. While this feature has its uses, I generally have it switched off.

Selecting the image

Choosing your 4K photo is extremely easy. There are a couple of ways of doing it. The first is to view your footage on the back of your camera, pause it and move through it frame by frame until you have the image you are happy with. You then simply save it to your card as a JPEG. The other way is to import your footage into Adobe Lightroom and capture your frame this way. Either way, you can carry out any editing in Lightroom or any other image-editing software, as you are now working with a JPEG. I use both methods, and they work equally well.

Even my nine-year-old daughter is a big fan of 4K photo. For her, its touchscreen functions are completely intuitive, and I wish my other cameras had this feature.

Lighting

If you are working in a studio setting, you can use your modelling lights or continuous lighting such as the Bowens Mosaics for your 4K photo. Outdoors, you of course have the resource of natural light at your fingertips. As with all photography, you still have to compose carefully and have your exposures correct in order to achieve great results.

ESSENTIALS

● LIGHTING.

If you plan to use 4K photo in a studio setting, you will need to consider your lighting. If you have standard studio lighting, use the modelling lights.

● SD CARDS.

Invest in some high-quality, fast SD cards, such as a U3-rated card. These read at 90MB/s and write at 45MB/s. The last thing you want when shooting 4K is a card that buffers and misses important information or frames.

● THE CAMERA.

You don't have to own a GH4 to achieve 4K Photo. You also have 4K options with the LX100, CM-1, FZ1000 and the G7, so there's something for everyone.



New Zealand-born Ross Grieve has been a professional photographer for more than 20 years. He runs a studio in Pembrokeshire and travels worldwide on his commissions. Visit www.rossgrievephotography.com



One particularly useful feature of taking a photo with 4K is that you can talk as you do so, and the camera records what you are saying. If I'm in the studio and using a new lighting set-up, this means I can talk myself through it, explaining what I've done, and listen back later. It's like taking notes, but in audio form.

For those of you who like to choose your aspect ratio, you have the full selection at your fingertips when shooting 4K photo, including 16:9, 4:3, 3:2, and 1:1. However, don't forget that different ratios will have more or fewer pixels in them. I tend to use 16:9 for a couple of reasons: I like the appearance of it, and also it gives me the biggest file size.

It's important with 4K photo to keep the same mindset as you do

when taking pictures conventionally. You are still a photographer – not a videographer – and you should think like a photographer, using all the same skills of composition, timing and lighting that you always have. With 4K photo, all you are doing is using a new way of making a still image.

Photographs are at their best when they are printed, and 4K photo is no exception. I have printed up to A3 size with superb results – one of my 4K images has even been used as the cover of a magazine. Be sure to print your 4K photos. Make a photo book or, as I'm doing, keep adding to a rogues' gallery going up the stairs. The days of reaching for my phone to take a snap are gone. For me, 4K photo means I now use my 'real' camera every time.

STEP 3



In Motion Picture mode, turn on 4K Photo. By turning on 4K Photo, the camera will adjust your setting accordingly. The camera is doing all the work for you.

STEP 4

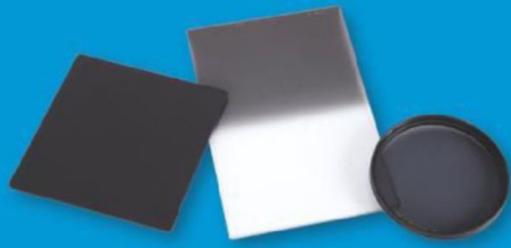


Within 4K Photo Menu you can choose your Video Aspect Ratio and turn Loop Recording on or off by going into set. You will see the number of pixels displayed, so you can choose what is best for you.

STEP 5



Your camera is now ready for 4K photo. It really is that easy. Now all you need to do is exit the menu and start filming, before deciding on the 8MP still images you'd like to extract.



The three essential filters

Despite the powers of Photoshop, you should still make room for filters in your kit bag, as **Jeremy Walker** reveals

So it's the 21st century and we are still putting pieces of plastic in front of cameras and lenses that cost millions of pounds to design and develop. Really? Surely it's possible to do everything in-camera or in post-production and there's absolutely no need for filters? Yeah, right!

There is a time and a place for modern electronic wizardry, either in-camera or using programs such as Photoshop, but I am a firm believer in getting it right at the time of taking. I already spend far too much time staring at a computer screen, so for me, going out on location, getting the shot and getting it right first time is a very satisfying experience.

That is not to say there is absolutely no place for pure electronics – the two methods can sit side-by-side – but I think there is a look and feel to an image where light is being transmitted through an optical surface, rather than something being invented out of a series of noughts and ones.

So I need to load my camera bag with hundreds of expensive filters then, do I? Simply put, no. There are two main types of filter: the glass screw-in, and the 'system', whereby one size of filter will fit many different diameter lenses via a universal holder and a removable adapter ring, which is an incredibly flexible and versatile system. The screw-in type has limitations, and if you have many lenses with different filter threads, you'll need a filter for each.

When I talk about filters, I am in fact referring to the system-type holder and, in particular, the Lee Filters 100mm system. I have been using this system for nearly 20 years because the optical quality of the filters is second to none. They are constructed not from plastic but optical resin made by the filter manufacturer itself to an incredibly high standard.

I consider three main filter types to be essential – some technical, to correct or balance exposure, and some for creative effect. Read on to find out more.

1 Graduated neutral density filters

Balance the foreground and sky for perfect landscapes taken in-camera

If I could pack only one filter, this would be it: a 2-stop, hard-edge neutral density graduated filter – or, as it is more commonly known, an ND grad.

An ND grad is a filter that is clear in the lower half and fades – or gradates – into a darker tone nearer the top. The dark tone of the filter is neutral (or, at least, it is in the better-quality filters) and should not affect the colour of the final image. The gradation can be varied, so the fade from light to dark can be either very subtle or quite strong – the filter is known as a soft or hard-edge grad respectively. The ND grad is used for balancing the exposure difference between foreground and sky, with the sky usually being the brightest part of the image.

If you don't use a filter and point your camera at a view, the camera's meter will invariably be fooled by the brightness of the sky and you will have a perfectly exposed sky and a dark or underexposed foreground. By metering for the foreground, the opposite will happen, leaving you with a perfectly exposed foreground

and a sky that is overexposed. By placing the dark area of the grad over the sky and the clear portion over the foreground, you will balance the exposure between the two. The filter can be moved up or down independently of other filters in the holder, so the area of gradation sits on the horizon or in another appropriate position for the shot.

Light levels

It really is that simple, although there are some variables, such as just how bright the sky is. A clear blue sky requires a different exposure from hazy cloud, which will be different again from cloud that's backlit by the sun. To counter these variables, ND grads come in different strengths, which are measured in whole or half stops, from 1EV through to at least 4EV, and can also be used in combination with other filters.

Calculating the exposure difference between the sky and foreground is easy: simply point your meter at one and take a reading, then point the meter at the other and take another reading, then look at the difference in



WITH FILTER



With a defined horizon,
a hard ND grad
is more appropriate

WITHOUT FILTER



Without an ND grad,
detail has been lost
in the highlights

shutter speed or aperture. A more difficult decision is whether to use a hard or a soft grad, but as a general rule of thumb, hard grads are for landscapes where the horizon is relatively flat and uninterrupted, while soft grads are for images in

which something breaks the horizon – a tree, for example. This is a rough guide and some experimentation will be needed, but once you know what your filters can achieve, you could combine soft and hard grads to feather the area of gradation.

KIT LIST

Lee Filters Digital SLR Starter Kit £199

This contains an assembled filter holder, a 0.6 (2-stop) hard-edge ND grad, a cleaning cloth, a Tri-Pouch, as well as a ProGlass 0.6 ND filter (see over the page for more details).

Adapter ring extra.



Formatt Hitech ND Grad Hard Edge Filter Kit £109

Comprising 0.3 (1-stop), 0.6 (2-stop) and 0.9 (3-stop) hard-edge ND grad filters, you'll need the dedicated 100 Modular Filter Holder (£45) and adapter ring (price depends on lens).



Cokin H250A ND Graduated Filter Kit £44

This contains a P-Series filter holder and a set of three graduated filters of varying strengths (you'll need to buy a separate adapter ring).



Using a neutral-density grad



1 Compose and meter

The first thing to do is to frame your image so you know how much foreground and sky is going to be included in the frame. With that done, meter for the foreground by pointing the camera downwards, without using the filter and in manual metering mode, and note the reading.

2 Set the exposure

Now meter for the sky, again with no filter, and note the reading. To work out the difference in exposure between the foreground and sky, compare the difference in shutter speeds. For example, if the first reading is 1/60sec at f/11 and the second is 1/250sec at f/11, the difference is two stops.

3 Shoot

Shoot a test frame at the first reading – the foreground should be perfectly exposed and the sky overexposed by two stops. Now slide a 2-stop (or 0.6 in Lee terms) hard-edged grad down to the horizon line and shoot another frame. You should end up with a perfectly exposed frame.

2 Neutral-density filters

WITH FILTER



For extended exposures and creative effects, the ND filter offers all you need

Neutral-density (ND) filters are often confused with ND grads, but the difference is simple. A neutral-density graduated filter has a clear area that gradates into a darker tone in the upper portion of the filter and exposure is only affected on the area of the image covered by the dark tone. With a neutral-density filter, the dark tone covers the entire filter, thus the whole image is affected by its use. Graduated filters tend to be rectangular and neutral-density filters are usually square, so if you can tell the difference between these shapes, you will know what type of filter you have in your hand.

Neutral-density filters are used to increase the length of exposure for creative or artistic effect, to emphasise movement or motion blur. The level of blur created depends on the strength of the filter, which you will find are most commonly available in 3, 6 and 10-stop strengths. ND filters can also be used in conjunction with ND grads, one controlling the exposure difference between foreground and sky, and the other controlling the amount of blur over the whole image.

WITHOUT FILTER



By increasing the length of the exposure, you can shoot images that the human eye can't record

Using a 10-stop ND filter



1 Compose

If you're using a Big Stopper, set the white balance manually to 10,000K. Frame and compose your image, as well as taking a meter reading. At this point, focus your shot as well, making sure that autofocus is turned off afterwards.



2 Set exposure

If you need a graduated filter to control the exposure between foreground and sky, insert the appropriate filter. Then work out the difference between your readings and an increase of 10 stops. For instance, 1/60sec becomes 16secs. Plenty of apps are available to help you with this.



3 Shoot

You're ready to shoot. Insert the Big Stopper in the slot nearest to the lens with the foam seal towards the holder. Cover the eyepiece to prevent extraneous light from entering the camera, then lock the mirror up. Use a remote trigger if possible and shoot.

3 stops

A 3-stop filter increases the length of exposure by, as the name suggests, three stops. This will allow you to introduce a hint of creative blur or motion, but still allow you to record some detail. You can meter directly through the filter and AF will work. They are useful for shooting city scenes or moving water, when just a hint of blur is needed.

My choice is Lee Filters' ProGlass 0.9, as it doesn't cause a colour shift and it is made from very high-quality glass. And they do not bounce off hard surfaces – I have tried.

“Neutral-density filters are used to increase the length of exposure for creative or artistic effect”



6 stops

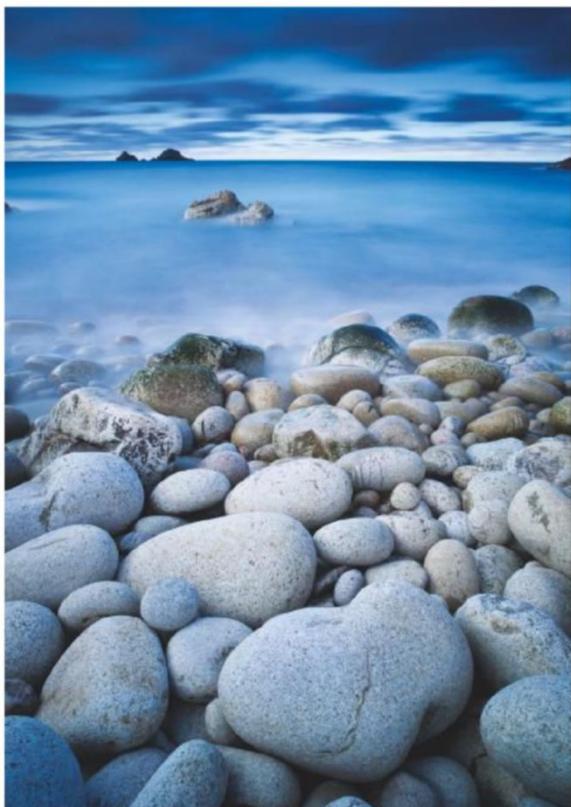
These are useful for waterfalls, rivers and smoothing out crashing waves. Composing the image is a lot easier without the filter in place. I use a Lee Filters Little Stopper, which is not technically neutral due to the type of glass it is manufactured from, but this is easily corrected if shooting Raw. The Little Stopper is similar to the ProGlass, but has a small foam seal on its reverse that must sit closest to the lens to prevent non-image-forming light entering the camera. The viewfinder should also be covered to prevent light entering the prism and mirror box.



10 stops

You can increase your exposure by a whopping ten stops for some really cool special effects. For instance, a meter reading that indicates 1sec at f/11 will change to 17mins with a 10-stop ND filter attached. Anything that moves in your image will blur – waves, rivers, people, clouds – while exposures of several minutes can easily be achieved in bright conditions.

Needless to say, you will need a sturdy tripod and a lot of patience. The Lee Filters Big Stopper is again not neutral, but by setting the camera's white balance to 10,000K you will reduce any colour shift. The Big Stopper also has to be placed nearest the lens in the filter holder, with its foam seal creating a light-tight barrier.



KIT LIST

Lee Filters Big Stopper £100

Designed for Lee Filters' 100mm filter system, this has proved incredibly popular. A smaller version is available for the Seven5 system for smaller cameras.



B+W 110 ND from £70 (58mm)

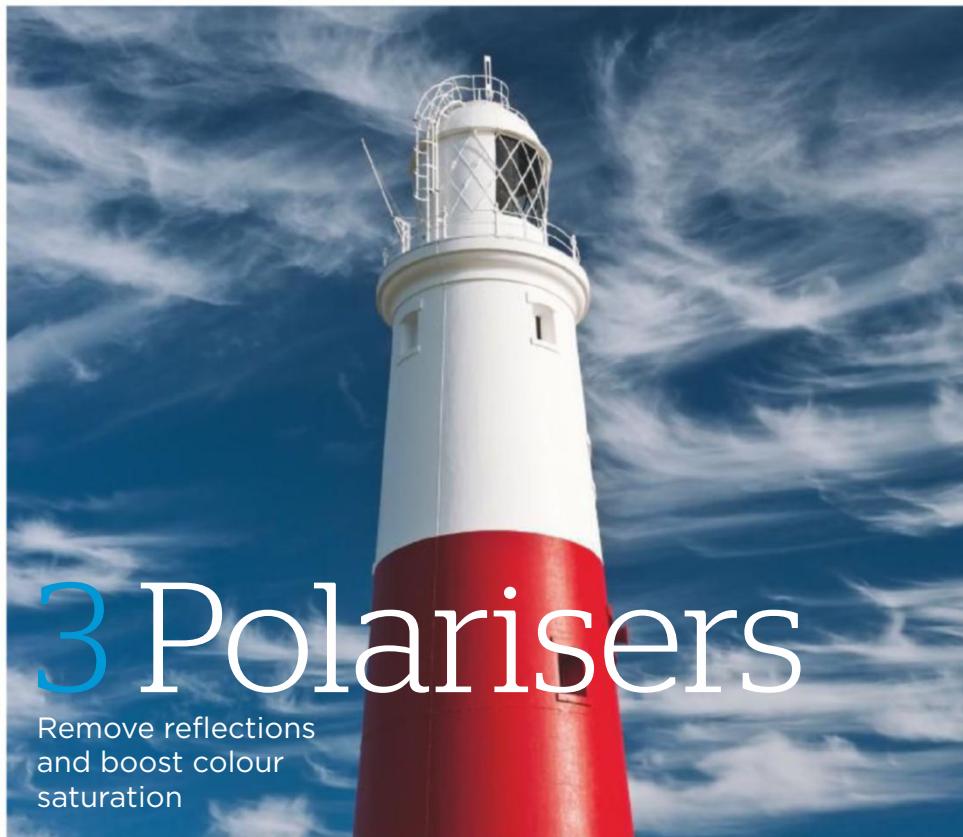
B+W's circular 10-stop ND filter is available in a range of filter sizes.



Tiffen Variable Neutral Density Filter from £100 (58mm)

This provides a variable 2 to 8 stops of light control, affording the convenience of using several ND filters.





3 Polarisers

Remove reflections and boost colour saturation

There are two types of polariser: linear and circular. The term circular polariser does not refer to the filter's actual shape, but to the way in which the light is polarised – in a circular motion. Linear polarisers have a habit of messing up autofocus and metering, so you should stick to the circular type.

Do you need a polariser?

A polariser has a couple of very important functions. First, it reduces reflections on surfaces such as water, metal, glass and even foliage, and second, it increases colour saturation and contrast – particularly noticeable when you have blue skies and fluffy white clouds in an image.

Autofocus and metering are both possible through the polariser once it is on the camera. The polariser can be freely rotated on its own ring to bring it to the point of maximum polarisation, which is visible through the viewfinder or live view. However, the polariser works best when you are viewing your landscape or scene at 90 degrees to the sun, so that your subject is cross-lit. If you are shooting into the light, the polariser will have little or no effect.

A bad habit to get into is just leaving the polariser on all the time

– use it only when it's necessary. The polariser can also be used in conjunction with other filters, such as neutral-density filters and grads.

Wideangle lenses

Another bad habit that many people fall into is using a polariser on a wideangle lens. If the lens is too wide, you will end up with blotchy, uneven skies going from light blue to dark and back to light again, leaving a dark patch in the sky. This is because the polariser can only polarise light up to a maximum angle, and when the lens is wider than this angle it causes the uneven appearance of the sky. Try looking at images shot on lenses wider than 35mm and see how the sky reacts to the polariser – at 24mm it will become very noticeable.

Polarisers are usually neutral in colour, but some come with a subtle colour tint or tone. Some polarisers have incredibly garish colours like gold and purple or blue and yellow hues in them. These are fun once or twice, but on the whole they are to be avoided.

So do I have the above filters in my bag? Too right I do. A polariser, a few grads and a couple of neutral density filters are invaluable and will go a long way to helping you improve your photography.

KIT LIST

Lee Filters Landscape Polariser Filter £175

This slim polariser will go down to 16/17mm without vignetting when used with a two-slotted filter holder on a full-frame 35mm Sensor. Also features a slightly warm bias.

Hoya Pro1 Polariser Slim Filter From £40 (40.5mm)

A multicoated filter to reduce lens flare, while the low profile reduces the risk of vignetting.



Tiffen Circular Polarising Filter From £30 (52mm)

A good affordable option to control colour and contrast.



WITHOUT FILTER



WITH FILTER



SIGMA



GRAND HOTEL EXCELSIOR, MALTA © JOE SMITH



SIGMA 12-24mm F4.5-5.6 II DG HSM

For Sigma, Canon, Nikon and Sony
Supplied with fitted padded case

**Ultra-wide-angle zoom lens designed for full frame
and APS-C size digital SLRs.**

Sigma created the world's first ultra-wide-angle lens, the 21-35mm F3.5-4, back in 1979. Things have moved on a lot since then. Designed for both full frame and APS-C SLRs, this ultra wide-angle zoom lens features the latest optical technology and provides excellent performance. FLD glass, which has performance equal to fluorite, and SLD glass provide excellent correction of colour aberration. Aspherical lenses give advanced performance with a compact and lightweight construction and ensure high image quality throughout the entire zoom range. The Super Multi-Layer Coating reduces flare and ghosting and incorporation of HSM ensures quiet and high speed autofocus as well as full-time manual focus capability.

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A mid-priced DSLR that also tips its hat to videographers

Canon EOS 700D

WWW.CANON.CO.UK

The Canon EOS 650D had been out for less than a year before it was upgraded to the 700D, and the changes were so slight that most people are still playing spot the difference. It seems to come down to little more than a slightly modified mode dial. Consequently, anyone considering purchasing the 700D should also consider the 650D (if you can find one), as they're virtually identical.

Both cameras appear to use the same 18MP CMOS sensor that was in the previous EOS 600D, but in fact it's different. In a bid to improve the video shooting experience, the 650D introduced Canon's new Hybrid CMOS sensor, in which some of the pixels were reassigned to provide phase-detection autofocus. This, when used in conjunction with the contrast-detect AF, provides faster and more accurate focusing with Live View and video shooting. In addition, the camera was the first EOS able to provide continuous AF with subject tracking in movie mode, aided by a new kit lens featuring an STM motor which provides a smoother, less jerky focusing action. As you'd expect of a DSLR with such a video bias, a mic input is included.

The 700D only has nine AF points, but at least they're all cross type, so work equally well in portrait orientation. Another key feature of the EOS 700D is its one-million-dot, 3:2 aspect ratio vari-angle capacitive touchscreen LCD



LAUNCH PRICE £749 WITH LENS

CURRENT PRICE £479 WITH LENS

panel. This enables users to select the focus point and trip the shutter simply by touching the screen. In review mode, you can swipe through your shots as you'd do on a phone.

In the range



What our test said

For those upgrading from an existing EOS DSLR, it's hard to recommend unless it's an entry-level model or an EOS 500D or earlier triple-digit EOS. But if you are trading in one of those, or are looking for your first DSLR, then it's a great option. It's a very polished and refined camera that will deliver the goods across a range of shooting conditions.

PROS

- Responsive touchscreen
- Fast AF
- Good video quality

CONS

- Plasticky
- Too few AF points and small buffer make it unsuitable for fast action



How it stacks up today

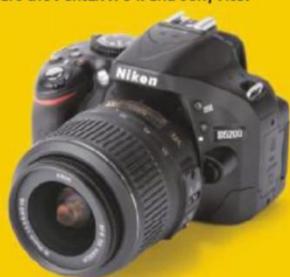
You can still buy the EOS 700D for under £500 with its kit lens, where its spec is hard to beat. Vari-angle touchscreen LCDs are common on CSCs such as the Lumix G range but not DSLRs at this price, and the same goes for hybrid AF sensors. While 24MP sensors are now the standard, 18MP is not so far behind as to be noticeably inferior. The video spec is good, but the AF performance for fast action stills can be beaten by most rivals even at this lower price.

Alternatives

The EOS 700D's closest rival at launch was the Nikon D5200. It boasts 39 AF points (9 cross type) but none of them are on the 24MP sensor, and while it also has a vari-angle LCD, it isn't a touchscreen. When it comes to image quality, the Nikon wins for resolution and dynamic range, while the Canon offers lower noise. Also worth a look are the Pentax K-5 II and Sony A65.

KEY SPECS

SENSOR 18MP CMOS with Hybrid AF
ISO 100-12,800 (expandable to 25,600)
BURST MODE 5fps
MOVIE Full HD 1080p video
DISPLAY 3in vari-angle touchscreen
DIMENSIONS 133 x 100 x 79mm
WEIGHT 580g (body)



The Canon EOS 700D Two users give their verdicts

David May

CRAWLEY,
WEST SUSSEX

I've only been taking pictures for a couple of years. Like many people, I started by photographing my family and friends, but I soon developed a love of nature photography and of seeing beauty in the small things we take for granted.

I started off with a Fujifilm FinePix S4200, but now shoot with the Canon EOS 700D, which I chose both for its features and for the price tag. Although it was a totally new system to me, it didn't take me long to get my head around the workings of the 700D, as it's very user friendly, whether in full auto or manual operation. I purchased the EF-S 18-55mm f/3.5-5.6 IS STM lens with the body and the EF-S 55-250mm f/4-5.6 IS II to extend the range.

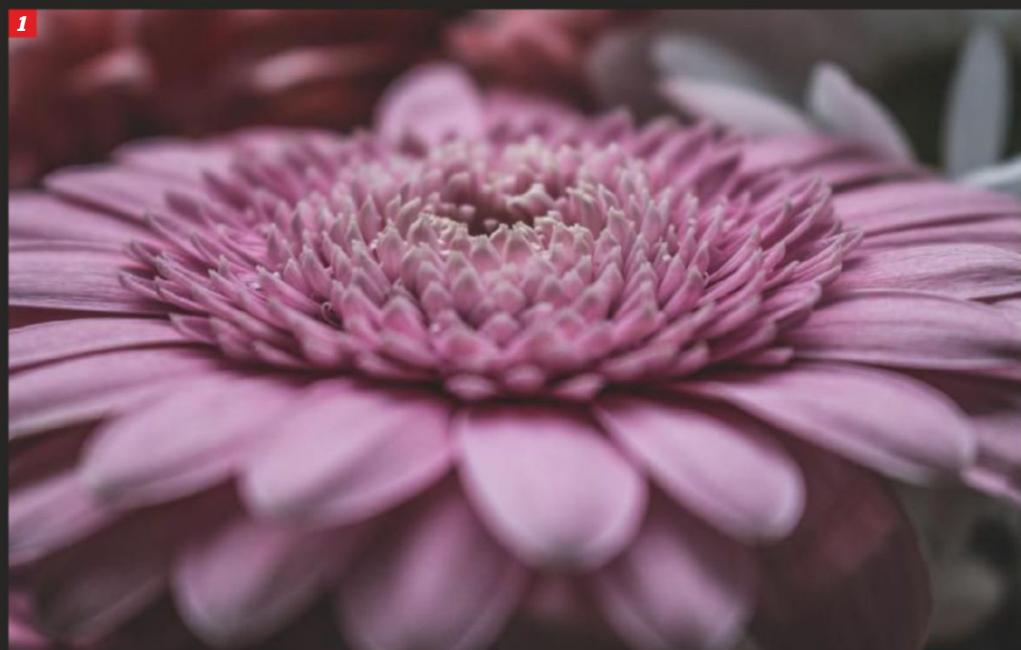
Not surprisingly, I am still working through all the camera's settings and features. I started out by shooting JPEGs, but soon discovered a whole new world opened up when working with Raw files – there's so much more detail and clarity.

One feature I particularly appreciate is the vari-angle Clear View LCD II touchscreen, which allows me to get to some hard-to-reach angles without having to lie on the ground. I've also customised various settings for quicker selection. All in all, the camera feels right, although I would love to see more cross-type focus points. In addition, I've found the creative effects and HDR mode rather disappointing.

Overall, the 700D has been the ideal camera for opening my eyes to everything from a bee working busily, or the after effects of a refreshing shower of rain. Our busy lives mean we don't always make time to take in these sorts of things, but this camera has helped me do exactly that.



WWW.FLICKR.COM/PHOTOS/105529413@N02



1

2



1 Pink ridges

Finding the small details of life and nature that get missed by busy lives is one of the main reasons I take pictures. I try to find inspiration in everything around me, and nature has to be one of the most rewarding subjects to photograph.

EF-S 18-55mm at 55mm,

1/80sec @ f/5.6, ISO 125

2 Burning blue

This is my interpretation of the burning bush and shows how light can be used for dramatic effect. I love painting with light as it requires me to open my creative toolbox.

EF-S 18-55mm at 24mm,

30 seconds @ f/7.1, ISO 100

1



2



3



Aaron Albores

MADRID, SPAIN

Ten years ago, I realised that I only had a handful of photographs as souvenirs of important moments in my life, so I bought my first camera – a Nikon Coolpix SQ – and took it with me everywhere. I am a creative person (I work as a graphic designer), and in the past I'd found music was a way of expressing myself. With the Coolpix, I soon discovered beauty in textures and objects, and I realised I could frame moments and turn them into beautiful pictures.

I soon became frustrated with the limitations of my camera, so I upgraded to a Canon EOS 400D, and spent several years learning and experimenting with it, mainly shooting street pictures, long exposures, landscapes and architecture, and, more recently, portraits. I always shoot Raw, and use AV and Manual modes depending on what I'm photographing.

Unfortunately, I lost my precious camera in an armed robbery, and it was a year before I could afford a new one. I stayed with Canon as I was familiar with it, and was lucky to find an EOS 700D at a very good price. This meant I could spend a little more on faster lenses.

The 700D is a superb camera, capable of producing high-quality images, and I like that it combines a relatively small size and light weight with very good grip and handling. Its vari-angle touchscreen is a nice feature and it has a great price-to-performance ratio. On the other hand, it's awfully noisy at ISOs higher than 800. I've never been happy with the placement and responsiveness of some of the buttons, which means it can be a little slow to set up in certain situations. However, these are only minor issues, because overall it is an excellent camera.

WWW.FLICKR.COM/PHOTOS/131722449@N03

**1 Stranger #16:
100 Strangers Project**
Afternoon in downtown Madrid. A perfect combination of subject, light and location. Sigma 17-50mm at 50mm, 1/100sec @ f/2.8, ISO 100

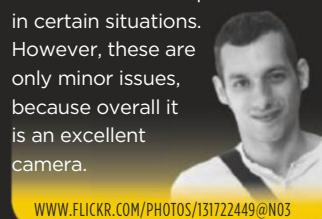
**2 Stranger #15:
100 Strangers Project**
Downtown Madrid. I had the perfect background, but had to wait for ages for someone who fitted it. Finally, Maria appeared. Canon EF 50mm f/1.8 II, 1/320sec @ f/1.8, ISO 100

3 Before they disappear
Father photographing children in a 'fog sculpture' by Fujiko Nakaya at the Guggenheim Museum in Bilbao. Sigma 17-50mm at 50mm, 1/2500sec @ f2.8, ISO 100

4 e
The beautiful helicoidal staircase at the Civil Engineers Association of Madrid. Tokina 11-16mm at 11mm, 1/60sec @ f/2.8, ISO 400

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To capture this pin-sharp shot, the camera's autofocus system was set to Zone AF with continuous (AI Servo) tracking employed



New versus old

Michael Topham tests the new Sigma 150-600mm f/5-6.3 DG OS HSM | C lens side-by-side with Sigma's popular 150-500mm f/5-6.3 DG OS HSM

WORDS AND PICTURES MICHAEL TOPHAM

When Tamron unveiled the SP 150-600mm f/5-6.3 Di VC USD lens in November 2013, it became one of the most attractive third-party telephoto zooms for sports and wildlife photographers. Favourable reviews and its ability to zoom closer to the action than Sigma's popular 150-500mm f/5.6-6.3 DG OS HSM put pressure on Sigma to produce a rival zoom.

Sigma replied with not one, but two 150-600mm lenses. The first to arrive was the 150-600mm f/5-6.3 DG OS HSM Sport – aimed at pros, with professional-grade optics and excellent durability for challenging, fast-action situations. Its sister model, on test here, is the 150-600mm f/5-6.3 DG OS HSM Contemporary – a lens geared towards enthusiasts with its more affordable price tag and portable, compact design.

Late last year, I was fortunate enough to be one of the first to try an early sample of the 150-600mm

f/5-6.3 DG OS HSM | S and I gave it a thorough test to find out how it performed at shooting motorsport. Extremely impressed by its versatility and all-round performance, I'm eager to find out if Sigma's Contemporary version is just as good and how it fares against Sigma's older, yet still very popular, 150-500mm f/5-6.3 DG OS HSM. Before revealing how it performs in the field, let's look at how the specs shape up on paper.

Specification

The main advantage the Sigma 150-600mm f/5-6.3 DG OS HSM | C has over the older 150-500mm

KEY SPECS

150-600mm
f/5-6.3 DG OS HSM
Contemporary

PRICE: £900
MOUNT: Sigma, Canon, Nikon
CONSTRUCTION: 20 elements, 14 groups
DIAPHRAGM: 9 blades
MAX APERTURE: f/5-6.3
MIN APERTURE: f/22
MINIMUM FOCUSING DISTANCE: 280cm
FILTER SIZE: 95mm
SIZE: 105 x 260.1mm
WEIGHT: 1,950g

f/5.6-6.3 DG OS HSM is the extra reach at the long end. To ensure the new lens maintains the same variable aperture through its extensive focal range, the front element has been enlarged and where the older 150-500mm had a 86mm filter thread, the 150-600mm's accepts filters and adapter rings with a 95mm diameter.

The internal construction has also been reworked: there are 20 elements in 14 groups in the new lens, compared to 21 elements in 15 groups in the older model. The new lens features three SLD glass elements much like the 150-500mm, but also includes one FLD glass element.



which is known for being the highest-level low-dispersion glass available for high light transmission to counteract chromatic aberration effectively. Based on this, I'm expecting to see an improvement in the way the lens handles aberrations, which I'll touch on later.

The focusing system relies on Sigma's Hyper Sonic Motor design (HSM) to deliver high speed and quiet autofocus, as well as full-time manual-focus override that can be set from the focus-mode switch and adjusted by rotation of the focus ring. It's also possible to customise the lens and adjust its AF speed and focus-limit settings by pairing it with Sigma's USB Dock.

Although the Contemporary lens doesn't employ the same splash and dustproof construction as Sigma's Sport variant, it does feature rubber sealing around the outside of the brass-made bayonet mount to prevent any ingress of water or dust.

It's all sounding positive so far, but there are a few caveats to consider. Weighing 1,930g, it's 150g heavier than the 150-500mm f/5.6-6.3 DG OS HSM, and with a 280cm minimum focusing distance it doesn't focus as closely. This, and the fact it's only available in Canon, Nikon and Sigma mounts means that it's not compatible for everyone. Pentax and Sony users wanting a long telephoto zoom of this variety will be more inclined to look at the older 150-500mm f/5.6-6.3 DG OS HSM that is available in five mounts.

Design

Positioned side-by-side with the 150-500mm f/5.6-6.3 DG OS HSM, the 150-600mm f/5-6.3 DG OS HSM | C has a clean, minimalist design that's in keeping with Sigma's line-up of current Contemporary, Art and Sport lenses. It loses the gold lettering previously synonymous with the brand, the focal length markings are clearer to read on the zoom ring, and the tripod collar is now flush to the barrel, whereas it protruded slightly on the older model. The focus-distance indicator sits ahead of the tripod collar, where previously it was positioned behind, and the zoom ring is larger, to make it easier to find when your eye is pressed up against the viewfinder. Regrettably, the same can't be said for the manual-focus ring, which is fairly thin by comparison and doesn't provide the same level of grip as the zoom ring.

LENS HOOD

The hood that Sigma supplies with the new lens is larger than that used on the 150-500mm f/5.6-6.3 DG OS HSM and is made from plastic. Although it's not constructed from metal like the hood that fits the Sport lens, it is lighter and the twist-to-lock design makes for fast attachment and removal.

The hood is large enough in terms of its diameter to be rested nose down on a level surface, but it doesn't feature the same removable and replaceable rubber ring as the Sport variant to help protect it. When I tested the Sport lens last year, the small screw that's used to secure the hood was lost. Those looking at the Sport version ahead of this Contemporary lens will be glad to know that Sigma has made the necessary modification to ensure that this locking screw is captive and irremovable.



To prevent the zoom from creeping when it's carried over the shoulder, the zoom lock can be engaged at any one of the eight marked focal lengths on the barrel. With the lock engaged, a sharp twist of the zoom ring can be used to unlock it instantly - a feature I found particularly useful on the Sport version when I wanted to keep the lens locked to a specific focal length on the move, but then be able to adjust it quickly for a spur-of-the-moment shot. This is an improvement on Sigma's older 150-500mm that could only be locked at the widest focal length and has to be released in the more conventional way using the lock/unlock switch.

The layout of four switches to control focus mode, focus distance, custom settings and the lens's optical stabiliser makes the appearance of the lens barrel a little more complex. However, they all add up to offer the user better control directly from the lens. The switch that's been added to prevent the autofocus operating across its full distance range is a good

example of Sigma's attention to detail, and it can also be used to ensure the lens doesn't try to focus too closely on a subject and prevent hunting over greater distances.

The optical stabiliser switch operates in the opposite way on the new model, so rather than flicking the switch forward from behind the camera to switch OS off, it now has to be pulled back. In the same way that the older 150-500mm offered two OS modes, there's the option to set optical stabilisation to Mode 1 or Mode 2. Mode 1 is intended to compensate for camera shake related to general photography, whereas employing Mode 2 turns off stabilisation in the direction of panning and is designed to enhance the effectiveness of the stabilisation when the lens is being used to capture moving subjects.

Performance

As to be expected from a Sigma lens equipped with the company's Hyper Sonic Motor, autofocus operation is consistently smooth across the focus





“To prevent the zoom creeping, the zoom lock can be engaged at any one of the eight marked focal lengths on the barrel”

range and goes about its business in a quiet and unpretentious manner. Testing the lens out in the field in the type of high-speed sporting environment for which it's made revealed a hasty autofocus speed, just like Sigma's Sport version. Switching between the older and newer lenses revealed an impressive responsiveness and accuracy from the 150-600mm f/5-6.3 DG OS HSM | C, and it proved to be fractionally faster at acquiring focus than the 150-500mm f/5.6-6.3 DG OS HSM. I also found the 150-600mm slightly faster at acquiring focus when asked to shift from a close subject to a distant one than vice versa.

The optical stabiliser performs admirably too, and like the OS system on the older 150-500mm it allows you to shoot up to 4 stops slower than is otherwise possible. The vital role the OS system plays in compensating for handshake is clear to see through the viewfinder when it's switched on and off. Plus, as well as operating more quietly than the 150-500mm, I found the positioning of the OS switch and the way it has to be pushed forward to activate OS more intuitive.

Although noticeably lighter and more compact than Sigma's Sport version, the Contemporary lens remains a fairly heavy optic to carry around on your shoulder all day. Attaching it to a monopod can help to

take the weight off. The compromise of having a bit more reach at the long end, however, is the effort involved in shifting the optics to the maximum focal length. Unlike the older 150-500mm, which operates across its zoom range in just under a quarter of a turn of the zoom ring, the newer 150-600mm operates across its range closer to half a turn. This means that while you can zoom from the widest end to full telephoto with a couple of twists from behind the camera on the older 150-500mm, it's a four-stage process on the newer 150-600mm.

Image quality

For prospective buyers and those considering Sigma's 150-600mm f/5-6.3 DG OS HSM | C as an upgrade from the older 150-500mm f/5.6-6.3 DG OS HSM, the sharpness it resolves and the way it deals with vignetting and chromatic aberrations is crucial. Testing the lens through its focal range at every aperture alongside the 150-500mm uncovered noteworthy differences. With the zoom set to 150mm, the newer 150-600mm exhibits fractionally less vignetting between f/5 and f/8, which is absent altogether by the time f/11 is reached. As expected, vignetting becomes more pronounced as the zoom is extended and corner shading appears at the edges from f/6.3-f/11 between 300mm and 600mm.

Close examination of my test images also revealed that where the aperture begins to close from f/5 to f/5.6 at 174mm on the 150-500mm, it closes at 180mm on the 100-600mm. It's a similar story at the longer end of the zoom, and where the aperture closes from f/5.6 to f/6.3 at 313mm on the 150-500mm it does so at 388mm on the 150-600mm, which results in it offering the user a slightly faster aperture advantage.

On the subject of sharpness, it was initially difficult to differentiate between the two lenses based on sharpness at the centre of the frame, but a closer inspection around the edge of my test images revealed that the newer 150-600mm is the sharper of the two in the corners. Examining images at close magnification also revealed an improvement in the way the 150-600mm tackles chromatic aberration, with noticeably less purple and green fringing apparent along high-contrast edges. This means less work is required in post-processing to remove it.

Final thoughts

For enthusiasts who aren't concerned about their long telephoto zoom being weather sealed to a professional standard, there's a £600 saving to be made in choosing the 150-600mm f/5-6.3 DG OS HSM | C over Sigma's 150-600mm f/5-6.3 DG OS HSM | S. Also, I could handhold it for longer periods, before using my monopod for extra support.

The excellent build quality, clean looks and subtle design changes all make it a superior lens; but if you already own the 150-500mm f/5-6.3 DG OS HSM and are considering trading it in, there'll be a £570-£600 difference to make up, as secondhand retailers are offering around £330 for the

older 150-500mm in

mint condition.

For the improvements the 150-600mm f/5-6.3 DG OS HSM | C lens brings over the older version, this amount of money may be

hard to justify. However, for enthusiasts buying their first serious long telephoto zoom it's one of the best and most affordable third-party optics.



The focus limit switch was used frequently while testing the lens

Self-timer vs intervalometer?

MARK HARNETT

Q I do a lot of fishing, often on my own and, therefore, I find it necessary to do self takes more often than not. Once set up on the tripod I have to pick up the carp and frame myself and shoot six or more shots of each side of the fish, often at night. I have no desire or knowledge to be setting specific settings, so a point-and-shoot set on auto would do me fine. Nearly all the pictures I take are between 3ft to 6ft away so powerful zooms are pointless but the following features would be very useful: have a flip out multi-angle screen; a good night-time and low-light camera; and a built-in intervalometer or sophisticated self-timer (most only take one shot when using flash regardless of settings). I am aware that I can buy a separate intervalometer but very few

cameras have the socket for the ones that do the job. Just wondered if any of you have or know of a make and model that would be able to meet my requirements I have a budget of up to £500. Thank you for any suggestions, as I've been looking for ages and am starting to think the perfect camera doesn't exist!



A An intervalometer appears to be what you need because a self-timer simply takes one shot after a pre-set delay, whereas an intervalometer continues to take pictures at a pre-set rate. The interval time is usually fixed before being started but some intervalometers can vary the rate while shooting; steadily increasing or decreasing the frequency, for example. Some gadgets can also make the



An external intervalometer gives you more flexibility than a built-in one

camera take pictures in response to an external event. Triggertrap, for example, turns your smartphone into a combined remote release and intervalometer which can also use the smartphone's sensors, like the microphone, GPS, etc., to make the camera take a picture. Many cameras, even some relatively inexpensive ones, can be triggered remotely using a cable release, and devices such as intervalometers simply use the same connection but offer more trigger options.

Another option worth exploring is Wi-fi control of the camera by smartphone or tablet, which is now widely supported, with both official camera manufacturer apps and some independent apps supporting the kind of hands-off shooting you need. Some cameras do offer a simple intervalometer function built-in, but this feature is relatively rare and by opting for an external device to control the camera you will avoid limiting your choice of camera model. **IB**

Macro requirements

ASHLEY C

Q My bridge camera broke a few months ago, so I thought I would get a DSLR. After a few months of saving up, I got the Nikon D7000 with a macro lens (a Tamron AF 70-300mm). It's great to try out different lenses and not just point and shoot all the time. I'm absolutely loving having to twist and turn to focus and zoom in. I like taking macro pictures of bugs, but at first I couldn't focus close enough, so I bought extension tubes on the internet. When they arrived, I tried to take a picture, but it was too dark. Then I had another look on Google and it mentioned settings, so I played around with them but to no avail. Then I thought about a light ring, but when I tried it I found it's still too dark. Is there anything I can do to start

taking macro images with the equipment I've got?



A First of all, getting close is not the primary objective of macro photography. You may find that you can get good macro magnification without having your subject almost touching the front of the lens. In macro mode and with the zoom set to 300mm, the Tamron AF 70-300mm delivers 1:2 reproduction, which is not bad. It does sound as if the extension tubes you have bought may be manual ones, without any communication between the lens and camera body, either mechanical or electronic, and are really only suitable for use with manual lenses that incorporate a mechanical aperture ring control. Your best bet is to look

out for a cheap but good-condition old Nikkor or Nikon-compatible lens with an aperture ring for use with the tubes. Don't bother with autofocus capability as this is unimportant with macro. Aim for a focal length of between 50mm and 135mm. **IB**

For macro shots, go for a lens with a focal length of between 50mm and 135mm

Lens compatibility?

GTFREIGHT

Q I have recently bought a bridge camera and have been looking at my old 35mm Pentax P30. It has a 70-210mm lens on it and I wondered if this was compatible with a digital camera body? Also, as I have no use for the Pentax, is there any value in it with said lens or is it obsolete and worthless?

A I will make a stab in the dark and guess that the lens you have is an SMC Pentax-A 70-210mm f/4 lens. This lens can be used on all current and recent Pentax

DSLRs, although it is not an autofocus lens. There is a chance if it's a different lens there could be some issues with metering compatibility and functionality, but nearly all K-mount lenses will work in one way or another with Pentax (and Samsung) DSLRs. For use with image stabilisation you will have to manually enter the focal length used via the camera menu system, which is rather inconvenient for a zoom lens. The reputation of the SMC Pentax-A 70-210mm f/4 is rather good and it has a macro capability. If you have the lens



The Pentax-A 70-210mm can be used on Pentax DSLRs

case you may find a close-up add-on lens stored in it. As for value, the P30 camera body is worth very little. The lens should be worth a bit more but it's hard to give a firm estimate. Your best bet is to check that they both work properly and see what happens on eBay or a similar auction site. **IB**

Back to bridge or go the DSLR route?

HEATHER LANDER

Q I read with interest your reply to Steve Cheatham in the April edition. A few years ago, I bought a Samsung NX11 and have the kit lens, a 70-200mm zoom and 20mm prime lens. I want to upgrade to a better camera and, as I found I never had the right lens when travelling, I considered the Panasonic FZ1000. However, it's a lot of money and I'm concerned that buying a bridge camera may limit me in the future and I will be left again with a camera that's out of date and not even a viable trade-in (as is the case with my Samsung). I've been reading reviews since Christmas, and looked in stores at various options and been shown cameras by Nikon and Canon salespeople.

Research points me at the Nikon D3200 or D3300. I think the Guide Mode could help me become a better photographer, and the camera feels comfortable to hold, better for me than the Canon 100D. But the kit lens isn't particularly rated and I am wondering instead about the



16-85mm lens you suggested to Steve or whether to try for an all-in-one approach with a single lens and invest in an 18-200mm or 18-300mm Nikon lens. Neither are cheap although I would look secondhand for a lens and possibly a body. It does make for a heavier camera though but I tried the 18-200mm lens in store and it felt balanced. I'm being more cautious than when I purchased the NX11; I want more longevity from the lenses so I can upgrade the body in the future and I want a good zoom, too.

A It's true that your Samsung NX11 body has relatively little residual value, but as long as it is in good condition, I would

expect you'd get in the region of £100 for it on eBay. You have invested in lenses and, apart from the kit lens, these hold their value better. Have you thought about going for the Samsung NX 18-200mm f/3.5-6.3 ED OIS superzoom lens? This effectively turns your NX11 into a camera that can match a bridge camera and with its larger sensor you should get better image quality than a typical bridge. If you don't have any particular issues with the NX11 itself the 18-200mm could be subsidised by the sale of your other lenses. Samsung's more recent NX camera bodies are good, so you should definitely consider staying with Samsung. On one hand buying a DSLR, and especially a Nikon or Canon DSLR, is a safe bet. However, you will be giving up the advantages of small size and weight of both the Samsung lenses and the camera body. Also there is evidence that DSLRs may have a limited future thanks to smaller and lighter interchangeable-lens cameras like the Samsung NX. **IB**

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Blue Fin Building, 110 Southwark Street, London SE1 0SU 020 3148 4795
Email: wdc@timeinc.com
Website: www.whatdigitalcamera.com

EDITORIAL

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Managing Editor Alisa McWhinnie
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Main cover image www.istockphoto.com

PUBLISHING & MARKETING

Managing Director Paul Williams
Publishing Director Alex Robb
Senior Marketing Manager Samantha Blakey 020 3148 4321
Online Manager Karen Sheard

ADVERTISING

Sales Manager Lesha Patel 020 3148 2508
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Classified Sales Enquiries 020 3148 2508
Midlands Office 01922 412720
Inserts Innovator 020 3148 3710
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Canon G1X or Fuji X-S1

HELLEQUIN

Q My brother is after a new (secondhand) camera: either the Canon G1 X (Mk I) or the Fuji X-S1, for the following reasons. He does not want a DSLR, preferring an 'all-in-one' package which is easily carried on bike trips. He wants better image quality than a 'standard' compact. His main subjects will be family holidays and his four-month-old son, along with a bit of street and landscape. He likes the fact that the X-S1 has a 'cover-all-bases' lens range and other interesting features; on the flipside, he'd like the acknowledged better image quality of the G1 X. He prefers how the X-S1 feels in the hand but likes the more compact body of the G1 X.

A From what you are saying I sense that your brother has a budget of around £300. The Fuji X-S1 is, for its time, a reasonably good bridge camera thanks to its relatively large 2/3rds-inch sensor and extreme telephoto lens. The Canon G1 X only has a 4x zoom but it has a much larger sensor and this does mean significantly better dynamic range and low-light noise performance. You will definitely notice the difference with any critical side-by-side analysis of the two cameras' images. I'd suggest he considers a different option; something like the Sony RX100, which uses a more up-to-date 1in sensor that is mid-way between the G1 X and the Fuji



The Sony RX100 is a good bet

XS-1 but outperforms the G1 X in a number of ways and is more compact and lightweight. Another option would be a Nikon 1 mirrorless Compact System Camera. These have the same 1in sensor size as the RX100 and offer the flexibility of a DSLR without the bulk. Olympus and Panasonic Micro Four Thirds mirrorless system cameras are also ideal for the constraints of travel. **IB**

Burglary forces change

DAVID VIA EMAIL

Q A couple of years ago we had a burglary and among the stuff taken were my Minolta cameras, although the three lenses were left behind. When the insurance paid out, I grudgingly I bought a Sony A55V as I reasoned that it would fit my old and comfortable lenses, but what I never reckoned for was the 70-300mm giving up, followed by the 35-70mm, today leaving me with the kit lens and a 50mm macro.

I'm not that happy with Sony, ever since I tried to get a new eye cup, so I'm thinking of switching. Having been through my donkey years with two 35mm bodies, several lenses, Hasselblad 500cm, 100 reels of film, Braun flashgun plus lead acid battery etc, I am now looking to travel light.

I have been looking at the Olympus OM-D E-M1 or E-M5, Samsung NX1 plus Nikon

5500 or 7xxx, or maybe a Sony Alpha 77.

My wife and I are off to Madeira next month and what I have left will cope, I feel, but we are visiting relatives in Australia for six weeks plus touring, so I would like a new outfit by then, but which?

I am thinking of buying it there for two reasons: it appears cheaper, and here in the Lot in France, where we live, good camera dealers are non-existent. Your only choice is supermarkets or furniture stores that sell TVs, and both of these only stock entry-level DSLRs, which are old models mostly, and point-and-shoots often at inflated prices. I wonder if you have any advice.

A There is no doubt that many photographers are glad to switch from bulky DSLR outfits to mirrorless Compact System Cameras,

especially if you aim for a collection of lenses as these are even smaller, relatively speaking, than the camera bodies. Today there is little, if any, compromise in image quality. Micro Four Thirds is the market leader and offers the widest range of lenses by some margin. The Olympus OM-D E-M1 is a good choice if you are interested in action photography, thanks to its on-sensor phase-detect autofocus system. If that isn't so important, then the new E-M5 Mark II is as good or even better in some areas and for less cash. The Samsung NX1 is an impressive-looking flagship camera but it is relatively big and heavy and lens selection is not as generous as with Micro Four Thirds. You should also consider Sony's Alpha 7 because you can use A-mount Sony and Minolta lenses on it using an adapter and it's full-frame. **IB**

Next month



© LEE FROST

Your best ever travel pictures

How to make sure you return from your holiday with photographs you'll treasure



Canon EOS 760D

With its high-resolution sensor, 19 cross-type AF points and 5fps capability, this is an entry-level DSLR to be reckoned with

Premium compacts

For those times when you want quality images and a camera that fits in your pocket

Lens tests

We try out the new Canon 24mm f/2.8 and Sony 24-240mm lenses

Up in smoke

How to shoot the surprisingly photogenic industrial landscape

On sale
3rd July

Treat 'em mean

Sometimes only a camera you can drop, dunk or desecrate will do. We abuse six compacts to find out which is the best performer when the going gets tough

WORDS • MICHAEL TOPHAM

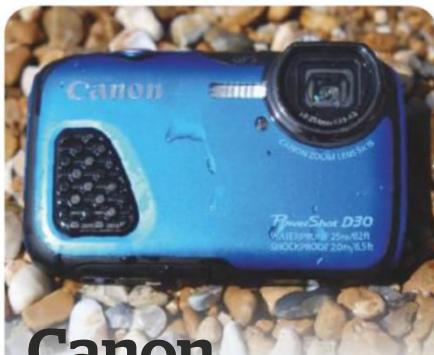
Compact cameras have been overshadowed by the convenience and practicality of smartphones in recent years, but it's important to remember that not all smartphones feature a tough, rugged or waterproof design and are not the best camera to use when you're faced by a challenging shooting situation. Taking snapshots around the pool, shooting on the beach or using a camera out on the slopes in

winter can present a high risk of damage and costly repair bills, unless you decide to take the precautionary measure of buying a tough compact that's designed to shrug off all the types of things you'd normally associate with breaking a camera.

This year's battle of the toughest compacts brings together six of the best models on the market from the likes of Canon, Nikon, Olympus, Panasonic, Fujifilm and Ricoh.

Last time we ran a similar test, Olympus and Panasonic models fared extremely well. It's going to be interesting to find out if they're still top of their game and how they all compare when they're subjected to a series of gruelling tests that'll see them dunked underwater, frozen in ice and dropped from arm's length onto a solid concrete floor. Over the page we'll examine each camera before revealing our verdict on which tough compact is the best.





Canon PowerShot D30 £229

WWW.CANON.CO.UK

The D30 lets you shoot underwater to a depth of 25m, can sustain a drop from 2m and is freeze proof to -10°C. Unlike the Olympus TG-4 and like the other models on test it shoots in the JPEG format not Raw and employs a 12.1MP CMOS sensor that works with a DIGIC 4 processor to deliver an ISO range of 100-3200. The 5x zoom (28-140mm) has a variable aperture of f/3.9-4.8, which isn't as bright as its Nikon, Ricoh, Olympus or Panasonic rivals. It's not the fastest of the sextet either with only a 1.9fps continuous burst, which made it much more challenging to get the perfect shot when shooting beneath the surface of the water. Canon's Intelligent IS system is on hand to prevent the effects of handshake and it's possible to tag shots with GPS data to log your journeys. However, I discovered our sample's screen was susceptible to light scratches and there's only one locking catch on the battery door. Two key features the D30 lacks are Wi-fi connectivity and USB charging.

Build & performance

The rubber grip at the front and rear prevents it from sliding out of your hands when they're wet, and the way the 3in, 461k-dot screen automatically rotates images as the camera is tapped or tilted is a nice thought. The concise menu and large buttons make it a breeze to set up and use, and despite only being available in one colour, it certainly looks the part in its metallic blue finish.

KEY SPECS

SENSOR	1/2.3in 12.1MP
LENS	5x optical (28-140mm) f/3.9-4.8
ISO	100-3200
DISPLAY	3in, 461k-dot
HD VIDEO	Full HD 1920 x 1080 @ 24fps
DIMENSIONS	109.4 x 68 x 27.5mm
WEIGHT	218g



Fujifilm FinePix XP80 £169

WWW.FUJIFILM.EU/UK/

The XP80 is the most affordable model on test and costs £180 less than the most expensive model here – the Olympus TG-4. Waterproof to a depth of 50ft, freeze proof to -10°C and shockproof to a height of 1.75m, it has a 5x optical zoom lens (28-140mm) with a variable aperture of f/3.9-4.9. Smallest of the six, the XP80 has a 2.7in, 460k-dot display, while the 16.4MP sensor offers an ISO range of 100-3200. There's the option to shoot at up to ISO 6400, but this setting is only effective when the image size is reduced to M (8MP) or S (3MP). Like all of its rivals, it provides +/-2EV exposure compensation from the d-pad, and there's a dedicated Wi-fi button to pair it with any mobile devices running Fujifilm's Camera Remote app. Face detection and continuous shooting at up to 10fps both feature, while it also comes equipped with an interval shooting mode and supports USB charging – perfect for the times when you'd like to top up the battery on the move.

Build & performance

The XP80 is best paired with those who have small hands. The plastic finish of the fascia doesn't feel as robust as its rivals, but it did manage to survive our brutal drop test. There's a good lock at the side to secure the battery/SD card door shut and the positioning of the soft zoom buttons is excellent. If purple isn't for you, it's available in blue and yellow as well as graphite black with a lime green trim.

KEY SPECS

SENSOR	1/2.3in 16.4MP
LENS	5x optical (28-140mm) f/3.9-4.9
ISO	100-6400
DISPLAY	2.7in, 460k-dot
HD VIDEO	Full HD 1920 x 1080 @ 60p/30p
DIMENSIONS	104.1 x 66.5 x 25.9mm
WEIGHT	179g



Nikon Coolpix AW130 £279

WWW.NIKON.CO.UK

Available in black, yellow, red and blue as well as a more unusual camouflage finish, the Nikon AW130 is equipped with a 16MP CMOS sensor and 5x zoom (24-120mm) that benefits from being slightly faster (f/2.8-4.9) than its Canon, Panasonic and Fujifilm rivals. Cold resistant to -10°C, shockproof from 2m and usable at depths down to 30m underwater, it boasts an altimeter and depth gauge, with convenient Wi-fi and GPS buttons. The 3in, 921k-dot screen has the highest resolution of the six and displays a bright, clear and crisp image. Lens shift VR and Electronic VR team up together to effectively compensate for handshake, and set to its auto mode the sensitivity can be set anywhere between ISO 125 and 6400. It can shoot a burst of high-resolution images at up to 7fps and the battery/SD card door features a robust locking mechanism just like the XP80. Behind this you'll find a USB port that allows convenient charging on the move using a USB power bank.

Build & performance

In the hand the AW130 feels similar to the Lumix FT5 – it's durable and nicely finished. The rear of the camera is littered with buttons, but the d-pad and the buttons around it are rather small. Underwater the AW130 was slow at acquiring focus and it took us a few attempts to bag a sharp shot. Regrettably, continuous shooting can't be set in the camera's underwater mode, unlike many of its rivals.

KEY SPECS

SENSOR	1/2.3in 16MP
LENS	5x optical (24-120mm) f/2.8-4.9
ISO	125-6400
DISPLAY	3in, 921k-dot
HD VIDEO	Full HD 1920 x 1080 @ 30/25p
DIMENSIONS	110.4 x 66 x 26.8mm
WEIGHT	221g



Ricoh WG-5 GPS £259

WWW.RICOH-IMAGING.CO.UK

The WG-5 shares many similarities with the excellent Olympus TG-4, not least its 4x optical zoom (25-100mm) which features a bright f/2-4.9 variable aperture that's ideal for shooting in low light. The 16MP sensor provides a sensitivity range of ISO 125-6400, while at the rear it sports a 3in, 460k-dot screen. Equipped with an electromagnetic compass and GPS function, it also features six LED lights around the lens to help illuminate macro subjects in its digital microscopic mode. Waterproof to 14m, shockproof from 2.2m, and freezeproof to -10°C, the WG-5 provides a front-facing LCD to display the time and your choice of altitude or barometric pressure. Unlike the XP80, AW130, TG-4 and FT5 though, it lacks Wi-fi connectivity to quickly transfer images to your smartphone or tablet. It has sensor shift shake reduction and an electronic level function, but the 1.5fps burst mode is the slowest of the six and hinders getting the perfect shot underwater.

Build & performance

The non-slip grip and large shutter button makes it a nice camera to handle and operate. It's chunkier and heavier than the others in this test, but this doesn't take anything away from its handling. Charging via USB is possible using the supplied cable, but the speed at which the zoom operates is painstakingly slow - taking around three seconds to get from the wide end to full telephoto.

KEY SPECS

SENSOR	1/2.3in 16MP
LENS	4x optical (25-100mm) f/2-4.9
ISO	125-6400
DISPLAY	3in, 460k-dot
HD VIDEO	Full HD 1920 x 1080 @ 30fps
DIMENSIONS	125 x 65 x 32mm
WEIGHT	236g



Olympus Stylus Tough TG-4 £349

WWW.OLYMPUS.CO.UK

The TG-4 is a new model hot off the production line and, just like the WG-5, it features a 4x optical zoom lens that's equivalent to 25-100mm. Rather than being offset like many of its rivals, the lens sits central to the body and boasts a fast and bright f/2-4.9 variable aperture, behind which lies a 16MP sensor offering an ISO range of 100-6400. Submersible to a depth of 15m, shockproof from 2.1m and freezeproof to -10°C, the TG-4's headline feature is its ability to shoot in the Raw format as well as JPEG - something we've been longing to see a tough compact offer. Manual aperture control is available via its excellent mode dial and it's equipped with Wi-fi, GPS, and a compass feature that also outputs pressure and altitude information. There are five underwater modes and 23 other scene modes to choose from. At the rear it sports a 3in, 460k-dot screen and a 5fps burst is possible at full resolution. USB charging and seven art filters complement its impressive spec.

Build & performance

The TG-4's textured thumb rest and front grip provides excellent purchase when you're working underwater or with slippery hands. The zoom lever is positioned on the top-plate as opposed to the rear, and the general operation and focus acquisition speeds both above and below water were perceptibly faster than its five rivals. The start-up/shutdown times are just as quick as the Lumix FT5.

KEY SPECS

SENSOR	1/2.3in 16MP
LENS	4x optical (25-100mm) f/2-4.9
ISO	100-6400
DISPLAY	3in, 460k-dot
HD VIDEO	Full HD 1920 x 1080 @ 30fps
DIMENSIONS	111.5 x 65.9 x 31.2mm
WEIGHT	247g



Panasonic Lumix FT5 £249

WWW.PANASONIC.COM/UK

The Panasonic Lumix FT5 is the oldest model in this sextet. It employs a 16MP sensor, which provides a wide ISO range of 100-6400 like the TG-4, while its 4.6x optical zoom is equivalent to 28-128mm with a variable aperture of f/3.3-5.9. Like the Nikon AW130, the FT5 integrates Wi-fi and Near Field Communication (NFC) technology. The latter enables users to transmit images quickly to an NFC-enabled device by touching two devices together. Capable of shooting a full resolution burst at up to 10fps, it also features optical image stabilisation to keep handheld shots free of blur and is shockproof from 2m, freezeproof down to -10°C and waterproof down to 13m. Like its TG-4, WG-5 and D30 rivals it sports a 3in, 460k-dot screen at the back, but unfortunately it relies on an external mains powered wall charger and doesn't support USB charging. There's a double lock to prevent the battery chamber from inadvertently being opened and it fires into operation in a hasty 2.3 secs.

Build & performance

The FT5 is comfortable to hold and operate. The grip at the front is great to wrap your fingers around and get a good grasp, while the metal front and back covers give it a good level of protection from shock or accidental knocks. The positioning of the zoom buttons makes zoom operation quick, but the AF speed and general response isn't as nippy as the newer and more refined TG-4.

KEY SPECS

SENSOR	1/2.3in 16.1MP
LENS	4.6x optical (28-128mm) f/3.3-5.9
ISO	100-6400
DISPLAY	3in, 460k-dot
HD VIDEO	Full HD 1920 x 1080 @ 50p
DIMENSIONS	109.2 x 67.4 x 28.9mm
WEIGHT	214g



Canon PowerShot D30

Image Quality

At ISO 100 the D30 resolves 24 lines per picture height (l/ph), with fine detail only affected by noise beyond ISO 800. Users will want to stay away from using ISO 1600 and 3200, but the camera's evaluative metering mode delivers consistently good exposures. Images are pleasingly rich in colour and contrast without being too oversaturated.

The D30's images are rich in colour and well exposed too



Underwater Test

To ensure our underwater test was fair, each camera was first set to its underwater mode with the flash switched off. The camera exposes for underwater scenes well, but the auto white balance didn't produce the most neutral colour and was beaten in this respect by the TG-4, WG-5 and XP80.



Underwater colour isn't as faithful as the WG-5 or TG-4



Fujifilm FinePix XP80

Image Quality

The XP80 is let down by its image quality performance. The sensor struggles to resolve the same level of detail as its rivals and at ISO 100 we recorded 20 lines per picture height on our resolution chart. As soon as the sensitivity is raised to ISO 200 and beyond, detail is quickly lost to noise, and ISO 3200 and 6400 should be avoided at all costs.

The XP80 showed a tendency to underexpose more than others



Underwater Test

The XP80's underwater performance was third best on test. The 10fps continuous shooting mode allowed us to capture a series of shots in quick succession and though it wasn't the fastest to focus on the model swimming towards the camera, the auto white balance produced a faithful representation.



Faithful colour was recorded in the XP80's underwater mode



Nikon Coolpix AW130

Image Quality

The dynamic range performance is excellent and a high level of detail is preserved in the highlights. Detail resolved from the 1/2.3in sensor is good too, with 24 lines per picture height being resolved at its base ISO 125 setting. Detail drops off slightly at ISO 400, while ISO 800 is the upper limit of the range we'd be prepared to push to on a regular basis.

The AW130 resolves good detail from its 1/2.3in chip



Underwater Test

Although the AW130 exposed well for our underwater scene, the autofocus system wasn't as responsive as others and our hit rate of sharp images wasn't as high as some of its rivals. The white balance shows a bias towards cyan and the results were similar to those produced by the D30.



A similar result to the D30 with an obvious cyan colour cast

MODEL: SADIE COLLIS

Freeze test

The D30 fired into life 37 seconds after breaking it out of a solid block of ice. All buttons operated straight away without any problems as you'd expect.

Shock test

Shockproof to 2m, the D30 was held at arm's length and dropped onto a solid floor – a test it passed with flying colours with no visual damage to the body.

Freeze test

The XP80 fired into life straight away out of the ice but the shutter button had frozen solid. There was a brief 2mins 53sec wait before the camera was fully operational.

Shock test

The XP80 claims it can survive an impact from 1.75m – not as high as its rivals but it endured our test onto a solid floor with only a minor dent on the edge of the body.

Freeze test

The AW130 fired into life straight away, but we had to wait for 4mins 19seconds before the shutter button and zoom lever had defrosted fully.

Shock test

Droppable from a height of 2m – much like the D30 – the AW130 showed no signs of damage or hesitation when asked to power up after a heavy impact.



Ricoh WG-5 GPS

Image Quality

Images straight out of the camera aren't as rich or vibrant as its rivals, but are a faithful representation nevertheless. At its base ISO it manages to resolve 26 lines per picture height like the TG-4, with detail being maintained well up to ISO 800, after which noise becomes more noticeable. An impressive level of detail was preserved in the highlights too.

Good detail was recorded in the highlights and shadows



Underwater Test

The underwater performance matches the excellent images produced by the TG-4 and there's a function for taking two consecutive underwater shots with the flash on and off. The 1.5fps burst at full resolution made it harder to get the perfect shot first time, but there's no faulting the accuracy of its colour.



The WG-5 performed very well in our underwater scene

Freeze test

The WG-5 powered up straight out of the ice block and after 2mins 34secs the shutter button had defrosted, allowing us to pre-focus and take a shot.

Shock test

The WG-5's solid and robust body is shockproof from 2.2m. Just like most of the others it survived our drop test without even a scratch to the body.



Olympus Stylus Tough TG-4

Image Quality

Vibrant colour and sharp images were captured, with 26 lines per picture height being recorded by the TG-4's chip at ISO 100 – an excellent detail performance only matched by the WG-5. The exposure system delivered good exposures too in tricky scenes, but as you push to ISO 800 and beyond, images gradually deteriorate as noise becomes more of an issue.

The TG-4 resolves excellent detail in shadowed areas



Underwater Test

The TG-4's rapid autofocus response made underwater shooting a breeze and it was a pleasure to use. It latched onto our subject instantly with no signs of hesitation or fuss. The underwater modes deliver rich, vibrant and faithful colour straight out of the camera, closely matched by the WG-5.



The TG-4 produced the best result of the six underwater



Panasonic Lumix FT5

Image Quality

The FT5's 16MP chip resolves 24 lines per picture height at its base ISO setting much like the D30 and AW130. The detail that's recorded gradually decreases as noise becomes more pronounced. Good detail is recorded between ISO 100-400, but at ISO 800 noise becomes increasingly obvious and you'll want to try to avoid using ISO 1600 and 3200 where possible.

The FT5's images appeared slightly cooler than others



Underwater Test

The accuracy of the white balance and vibrancy of colour is no match for its TG-4 or WG-5 rivals. Although our underwater images displayed low saturation, the 10fps burst allowed us to capture many shots in quick succession and later choose which was best from our set.



The FT5's images showed relatively low saturation

Freeze test

The FT5 turned on 54secs after breaking it out of a block of ice. I was able to pre-focus and take a shot a minute later once the on/off button had defrosted fully.

Shock test

The FT5 is shockproof to 2m and we held it at arm's length before dropping it. It endured the test easily and switched on just like it did out of the box.

Verdict

The stringent tests we've carried out in this review have revealed that of the six tough compacts tested, some perform better in one area than another. Take the Fujifilm XP80 as an example. Although it performed third best underwater and offers useful features such as Wi-fi and USB charging, its image quality is a letdown, particularly at high ISOs. Canon's D30 produces superior image quality and performed well in our freeze test, however its auto-white-balance system didn't produce the most neutral colour underwater and it's lacking a few key features such as Wi-fi connectivity, fast continuous shooting and the facility of USB charging. The Panasonic Lumix FT5 was our joint winner of the tough compacts two years ago, but is now starting to show its age up against its new rivals. It still offers some great features – 10fps continuous shooting, Wi-fi and NFC just to name a few – but images lack vibrancy underwater and its



Each compact was frozen overnight to find out how they'd perform in ice-cold conditions. The Olympus TG-4 and Canon D30 were the two best performers straight out of the freezer

autofocus response has nothing on the TG-4. The Nikon AW130 didn't fare best in our underwater or freeze tests. It comes well equipped with a strong set of features and resolves a good level of detail in its images, but we would have liked manual control of aperture and the option to shoot continuously at up to 7fps in its underwater mode. Like the Canon D30, the Ricoh WG-5's continuous burst (1.5fps) is disappointingly slow, its menus and icons appear rather dated, and the zoom doesn't operate quickly across its range. That said, the images it produces are excellent – particularly underwater – and a good range of optional accessories are available. Olympus has a strong heritage in the tough compact market and the TG-4 is the clear winner here. It has all the features you want, including a fast lens and

“Olympus has a strong heritage in the tough compact market and the TG-4 is the clear winner”

a mode dial. It backs this up with a snappy operational performance, great handling and produced the best images straight out of the camera, both above and below the water. The best feature of all is its ability to shoot in Raw and offer unsurpassed control at the editing stage, not forgetting the excellent range of converters, lights, covers and cases that are available too for those who want to get even more adventurous. It's not the cheapest, but if you're after the best tough compact camera on the market it's a price you'll be happy to pay.



Canon PowerShot D30 £229



PROS

- Solid build • GPS
- Large buttons • Intuitive menu
- Active display
- Close focusing (1cm)

CONS

- Slow continuous burst rate
- No Wi-fi connectivity
- No USB charging

Fujifilm FinePix XP80 £169



PROS

- Wi-fi • Battery lock
- Underwater performance
- Burst speed
- USB charging

CONS

- Image quality
- Small screen
- Lens isn't as fast as rivals
- Plastic fascia

Nikon Coolpix AW130 £279



PROS

- Wi-fi • NFC • GPS
- Altimeter and depth gauge
- Build quality • USB charging
- Screen • 7fps continuous shooting

CONS

- No continuous burst in underwater mode
- Underwater white balance
- Small buttons

Ricoh WG-5 GPS £259



PROS

- Fast maximum aperture (f/2)
- Image quality
- Front-facing LCD • GPS
- Close focusing (1cm)
- Optional accessories

CONS

- Burst speed
- Slow zoom • Screen is susceptible to scratching

Olympus Tough TG-4 £349



PROS

- Fast maximum aperture (f/2) • Raw
- Mode dial
- AF response • Art filters
- Compass • Optional accessories
- USB charging

CONS

- Zoom lever positioned on the top-plate
- Most expensive

Panasonic Lumix FT5 £249



PROS

- Wi-fi • NFC • Strong build quality
- Start-up speed
- Clear menu system
- Various colours available

CONS

- No USB charging
- Underwater images lack vibrancy
- Screen scratches easily

COMPETITION

Win

Worth
£450!



Win a Rycote Classic Softie Camera Kit and Sennheiser MKE600 microphone!

You could win this great prize bundle that's perfect for budding videographers

We are offering one lucky reader the chance to win this fabulous prize courtesy of Rycote and Pinknoise Systems. The Rycote 15cm Classic-Softie Camera Kit is the essential all-in-one kit for outside filming using a shotgun-camera-mounted microphone. This versatile kit contains a microphone shockmount with attachments suitable for mounting video cameras, booms and stands, as well as excellent protection against wind noise from the Rycote Classic-Softie. See the video explaining the product at: <http://vimeopro.com/rycotevimeo/rycote-uk/video/101320771>

The Sennheiser MKE600 video camera/camcorder microphone is able to handle even demanding filmic challenges. It picks up sounds coming from the direction in which the camera is pointing and effectively attenuates noise coming from the sides and rear.

Answer this question:

From which sound does the Softie Camera Kit provide protection from?

Closing date: 6 July 2015

For more details about these prizes visit www.rycote.com and www.pinknoise-systems.co.uk

TO ENTER, VISIT
whatdigitalcamera.com/julycomp

Just for Fun

Test your photo knowledge and have some fun with the all-new **What Digital Camera** brainteasers below



* Straight lines (forwards, backwards, up, down or diagonally)

Quiz and wordsearch

Decipher the clues and then find the answers hidden above!*

- 1 What does the R stand for in DSLR?
- 2 German born fashion photographer, Helmut, didn't discover gravity
- 3 Another word used to describe Compact System Cameras
- 4 Camera brand bought by Ricoh in 2011
- 5 Company founded by George Eastman in 1888
- 6 Ultra-wideangle lens that, with some examples, produces circular images
- 7 British documentary photographer known for his lurid use of colour
- 8 The most popular type of image file format
- 9 Word to describe the aesthetic qualities of out-of-focus areas produced by a lens
- 10 Photographers who shoot celebrities, often unawares

Guess the mystery camera!

Do you recognise either of these popular cameras?



LAST MONTH'S ANSWERS: 1 ADAMS 2 CYBERSHOT 3 MONOCHROME 4 POLARISER 5 ERWITT 6 TELEPHOTO 7 JOBY 8 RANKIN 9 NOISE 10 HOTSHOE. Last month's mystery cameras - Canon EOS 300D and Panasonic Lumix LX100. Don't forget to buy next month's issue to find out all the answers.



Tales of the city

Towns can be noisy, dirty, busy and stressful – which is what makes them such a perfect and dynamic subject for photography. Here's how to make the most of the urban environment

WORDS AND PICTURES CRAIG ROBERTS

On a sunny day, it's natural for most photographers to head out into the countryside. A short drive can get you to a beautiful stretch of coastline or sweeping landscape here in the UK. However, in your rush, you probably passed another location bursting with photographic potential: the urban landscape. Your town, along with every other town and city in the country, is a fabulous subject, no matter how boring or dull it may seem at first.

All towns have a mixture of old and new architecture, both of which are worthy subjects. At first glance, you might think that that newly built office block is a monstrosity, but look more closely and you will see they are works of art, designed by architects with an acute eye for detail. You can visit a town early on a Sunday morning and have the place to yourself, or visit the same location first thing on a Monday and be confronted with a busy, bustling environment, full of drama.

Our city streets are exciting places. They constantly change with the direction of light, the people that pass through them and the contrasts between all the buildings. There are new views everywhere, from wideangle vistas to interesting abstracts. There's noise and chaos, yet calm contemplation at the turn of a corner. From busy high streets to peaceful green spaces, the urban landscape offers every opportunity a photographer could hope for.

Craig's new ebook, *Urban Landscapes: A Photographer's Guide*, is now available at www.craigrobertsphotography.co.uk, price £5.99

Selfridges Building, Birmingham. Graphic shapes and a polarised sky make a perfect combination. Olympus OM-D E-M5, 20mm, 1/250sec @ f/8, ISO 200, polariser



Tip 1 Work with the architectural style

Old and new. Modern skyscrapers to old churches. Sleek shopping centres to derelict Victorian originals. Every town and city has its own mix of architecture and each must be approached in a different way. The sleek and often futuristic lines of modern structures are open to more creative ways of capturing them. Shoot them with a wideangle lens and make the most of any distortion created for impact. They can also be captured in harsher light, making them ideal to shoot when the sun is higher in the sky.

Older buildings deserve a little more respect, however. Their façade reveals their history and you should capture them in the best light to reflect this. So, shoot early morning or late afternoon when the light is warmer, and use this ideal light to bring out the rich colour and texture of the stonework, keeping the camera as straight as possible to avoid unnecessary distortion.

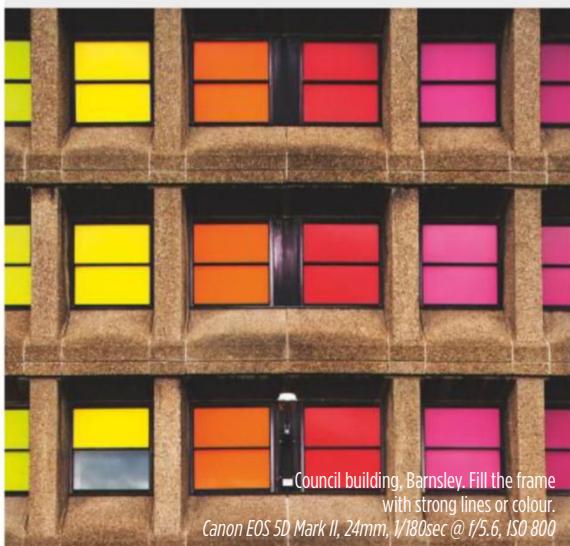
La Défense, Paris.

Look up and exaggerate the futuristic lines of modern buildings.

Canon EOS 5D Mark II, 28mm, 1/90sec @ f/8, ISO 200

Tip 2 Focus on details

Changing from a wideangle lens to a telephoto means you can crop closer on your urban subjects and concentrate on the more intricate details in the view. Shooting abstracts is all about looking for the shapes, patterns and colours within the scene. Look for areas of light and shade, diagonal lines and any reflections created by the abundance of glass used in a city. Don't be afraid to tilt the camera if you need to, to suit the details and make the most of it.



Council building, Barnsley. Fill the frame with strong lines or colour.
Canon EOS 5D Mark II, 24mm, 1/180sec @ f/5.6, ISO 800



Canary Wharf, London. Night shoots give your urban views a whole new look.
Olympus E-M1, 12mm, 8 seconds @ f/8, ISO 200, tripod

Tip 3 Work into the dusk

One great advantage of shooting in an urban environment is that you can continue shooting even when the sun has gone down. As day turns to night, your urban location is lit by a different light source as the streetlights and interior lights of buildings illuminate the environment. So, grab a tripod, connect a cable to your camera and get set for some great new possibilities. Your exposures will run into seconds or even minutes, but in that time, all sorts of things can happen.



Tip 4 Shoot from low angles

Like many photographers, I shoot most of my images from standing height, but there is a whole new perspective to be had by crouching down and shooting low. Shooting from pavement level gives a worm's eye view of the world and it's amazing how different things look from down there. Use a wideangle lens to make the most of this exciting new angle, filling the foreground with any interesting feature you can find. Include drainage grating, cobbled streets, road markings, reflections in puddles after rain and even people's legs to fill the foreground. Use a small aperture to make the most of depth of field and focus around a third of the way into the view to maximise this. Use your camera's LCD screen to help frame up your shots, or, if your camera has Wi-fi, connect the camera to your smartphone and use this as your viewfinder.

Shoreditch, London.
Crouch down and fill the foreground with features unique to the urban environment.
Olympus E-P5, 12mm,
1/125sec @ f/8, ISO 200,
0.9 ND soft grad

Tip 5 Fit a polariser

A polariser is a fantastic filter for adding impact to your shots. On a sunny day you can use one to deepen the blue of the sky, which will look great against the sleek lines of a modern building. They can also be used to reduce glare and reflections from any glass surface, again adding impact by increasing contrast.

Remember, when enriching the sky they only work at a 90° angle to the sun, but work at most angles when reducing glare from windows.



Tip 6 Include people in the frame

With many of your views, you might prefer not to include people in your shots, but this is the time to embrace them as part of your composition. Just like traffic, they can provide an interesting addition when captured with a slower shutter speed, but you can also capture people in their own right. This takes a keen eye and perfect timing, but people make great subjects to shoot candidly. Preset your camera to capture those brief moments in time.

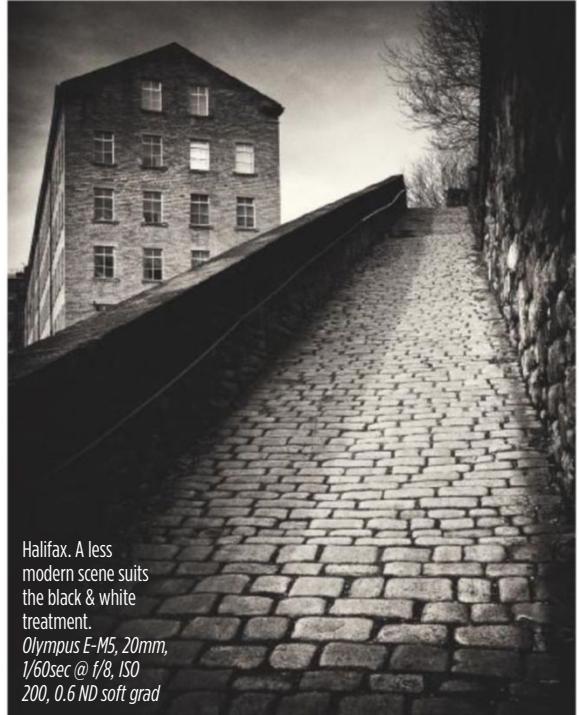


Tip 7 Deal with the jobsworths

One burden when shooting in an urban environment is dealing with exuberant security guards. They see someone with a camera and pounce, telling you to stop shooting. However, if you are on public land, i.e. most streets, you are well within your rights to carry on shooting. So, be polite, stand your ground and explain you are merely shooting for yourself and within the law of where you can point your camera. Many are just interested in your intentions, but even if you are using a tripod, you can still carry on shooting.

Tip 8 Convert to black & white

You don't have to shoot all your urban images in colour; shooting in black & white or converting them on the computer adds a gritty feel to your images, and reduces them to the elements of light and shade. Removing the colour focuses the eye more on the subject and can often tell a better story about its part in the urban jungle.



Halifax. A less modern scene suits the black & white treatment.
Olympus E-M5, 20mm, 1/60sec @ f/8, ISO 200, 0.6 ND soft grad

Tip 9 Introduce movement

You can add impact and drama to your urban images by capturing movement. A slower shutter speed and some fast-moving traffic captures the business of a modern city, where everyone is rushing from A to B. A red bus, colourful taxi or even a splash of yellow from a construction truck will add movement and colour to your images, bringing them alive with added movement making a great complement to the buildings in the background.



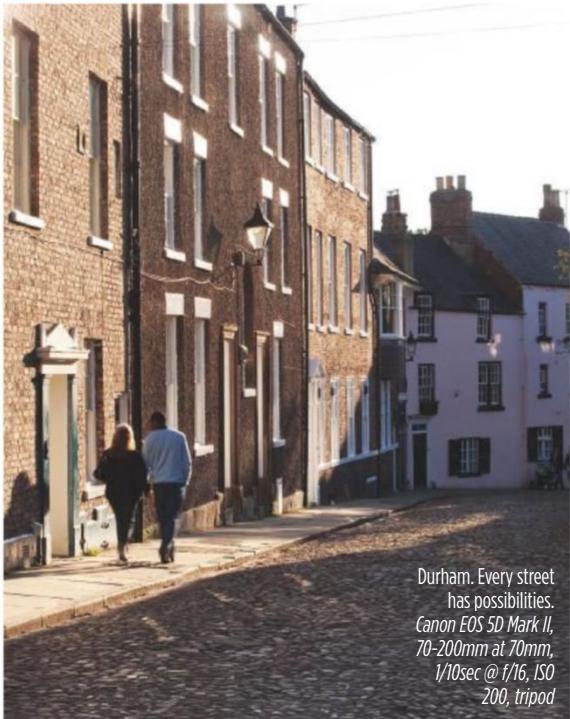
Use a tripod or your camera's image stabilising to introduce blur with a slow shutter speed.
Olympus E-M5, 45mm, 1/10sec @ f/5.6, ISO 200, 0.9 ND standard

Glasgow. Staircases and escalators are more interesting than you may first imagine!

Canon T90, 50mm,
1/15sec @ f/5.6,
ISO 100

Tip 10 It's not all about the outdoors

If a sudden downpour catches you out, head inside, but continue shooting if you do so. Whether it's a museum or art gallery, shopping centre or even the local train station, there are often shots to be had. Increase the ISO on your camera to around 800, change the white balance to match the lighting, and look for details and interesting features in this new unexpected location.



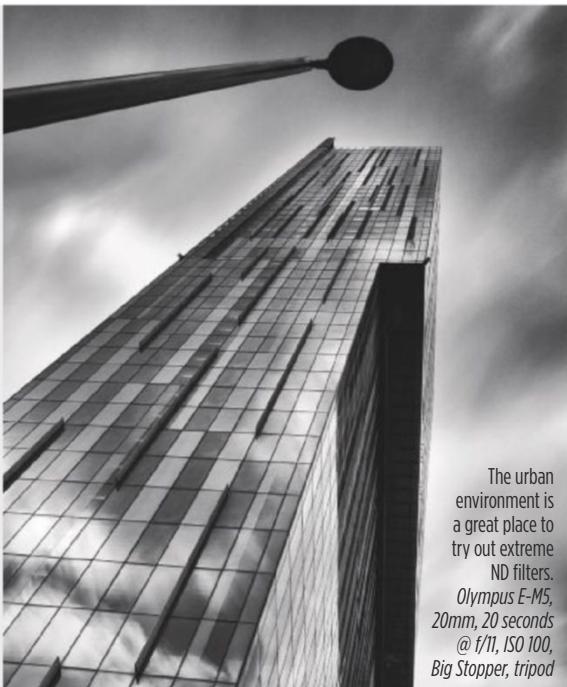
Durham. Every street has possibilities.
Canon EOS 5D Mark II, 70-200mm at 70mm, 1/10sec @ f/16, ISO 200, tripod

Tip 11 Close to home

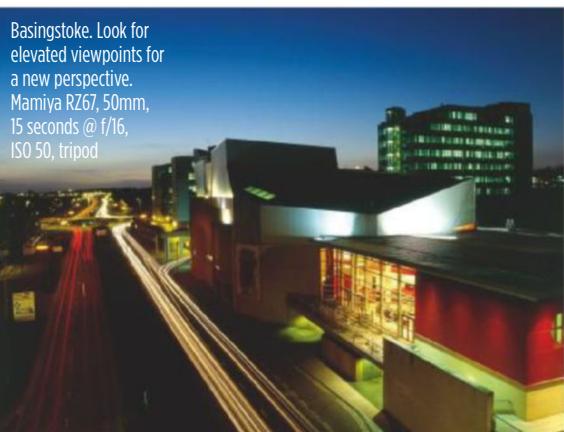
Your hometown is as good a location as any. You often need to look at it with fresh eyes to see the full potential, as we can become so familiar with our own environment that we forget what there is to shoot. View it as a photographer rather than a resident. Use your local knowledge, however, to get the best views. You'll know the best way to access each location, where any roadworks are taking place and perhaps even where the sun illuminates a certain building at different times of the day. Even with this useful info, you'll quickly realise how easily you missed some great photographic potential as you view the location with your photographer's head on.

Tip 12 Go long

You can use your tripod in the daytime, too, and combined with an extreme ND filter, you can capture some dynamic and interesting results with a long exposure. With movement from clouds in the sky and any water interest that many cities have, you can blur these with an exposure of 1-3 minutes, and capture the contrast with the static subjects of the city. This is a particularly useful technique when the weather is overcast, and offers a different way of capturing your chosen city.



The urban environment is a great place to try out extreme ND filters.
Olympus E-M5, 20mm, 20 seconds @ f/11, ISO 100, Big Stopper, tripod



Basingstoke. Look for elevated viewpoints for a new perspective.
Mamiya RZ67, 50mm, 15 seconds @ f/16, ISO 50, tripod

Tip 13 Take the high view

Another advantage of shooting in town is that you can often get a higher viewpoint for another perspective. Whether it's climbing a few stairs, getting the lift to the top of a building or even going to the top level of a car park, this new view will add to your portfolio of images and capture the city from above. You can shoot wide for the full view or zoom in on details with a telephoto, both providing interesting results.

Tip 14 Research using Google Maps

With any location you visit, it's worth doing a bit of forward planning to make the most of your day. Using websites such as Google Maps will help you identify possible locations and you can even use Street View to see the exact location and spot to shoot from. The satellite view also gives you an idea of where the sun will be positioned throughout the day, although the Photographer's Ephemeris elaborates on this, marking the sun's position on a map throughout the year.

www.googlemaps.co.uk
www.photoephemeris.com



Tip 15 Stay safe

This applies to where you stand, as well as shooting in an environment where there are other people around. Remember first, you are working in a busy location. As you work, avoid getting in people's way and, most of all, be aware of traffic all round you. You don't want to get run over! If shooting in off-street areas or at night, then keep your gear discreet - this is where one camera and one lens is ideal, as you don't want to attract attention. If you are nervous of shooting at night, then take a friend or partner with you. Most locations are perfectly safe when there are other people around, but it pays to be sensible.

Manfrotto 190 Go! £160

WWW.MANFROTTO.CO.UK

Manfrotto's 190 tripods have a reputation for offering a decent working height without excess weight. The new 190 Go! is a four-section aluminium model with a 90° tilting centre column, but, in a first for Manfrotto, it has twist-type leg locks rather than the lever type. This is the lightest and most compact tripod in the 190 range, but it's also 13cm shorter than the existing four-section version.

The legs can lock at four different angles, set using large, easy-to-press levers, and one has a rubberised grip for easy carrying. A 38in-thread Easy Link socket on the central 'spider' can be used to attach accessories to the tripod, such as magic arms for holding lights. But the standout feature is that the centre column can quickly be set to a horizontal position by pulling it up to its maximum extension, pressing a button at its lower

end, then pulling it up a little further and folding it down 90°. It can then be freely rotated to any position you choose.

With typically solid Manfrotto build quality, the 190 Go! is a tripod that just works. All the movements click and snap into place with precision, and the twist-leg locks are particularly quick to use; if anything, I prefer them to Manfrotto's traditional clips.

In terms of load, the 190 Go! will happily hold an enthusiast DSLR with a large zoom lens such as a 70-200mm f/2.8, and with the centre column extended it will hold the camera at eye

level for a 6ft-tall photographer. This distinguishes it from lightweight travel tripods, which generally won't manage either. In summary, this is a tripod that's sure to become a favourite with enthusiast photographers looking for flexible and reliable support. **AW**



“All the movements click and snap into place with preicison and the twist-leg locks are particularly easy to use”

PROS

- Centre column easy to rotate
- Twist leg locks

CONS

- Heads with 1/4in threads will need an adapter



Grub screw

When tightened, this grub screw prevents the head from unscrewing.



3/8in connector

This connector is compatible with many heads, but those with 1/4in threads will need an adapter.

Strap lug

This is for the attachment of Manfrotto's carry strap. It can also be used to hang a camera bag for extra stability.

TECH 21 PATRIOT IPHONE 6 CASE £40

WWW.TECH21.COM/

STYLES/PATRIOT

If you're out in challenging shooting conditions, taking your smartphone can be risky. But the Tech21 Patriot case should protect it. The case is made of a tough but flexible plastic, while a built-in Impact Shield cover protects your screen and the home button. As well as protecting from impact – I dropped my phone from 2.5m onto a wooden floor, and it survived – the case also makes the phone splashproof. Even with the cover, the touchscreen is still usable, and all the buttons are mimicked on the case so they can all still be used. Obviously the only things not covered are the front and rear cameras. A useful addition is a removable plastic holster that includes a sturdy belt/strap clip. I found this to be very secure, yet it takes just a second to unclip and release the phone.

Overall, the case offers superb protection for Apple iPhone 5S, iPhone 6, iPad Air and Samsung Galaxy 6. **RS**



MOSSY OAK BREAK-UP CLOTH TAPE £8.99

[HTTP://STORE.MOSSYOAK.COM/](http://STORE.MOSSYOAK.COM/)

Many wildlife subjects are easily scared off by the obvious presence of humans. One of the only ways to photograph such subjects is to stay quiet and be concealed. Mossy Oak Break-Up Cloth Tape is designed to offer a solution for camouflaging your kit. This 5cmx3m tape is handy for covering tripod legs, lenses and lens hoods. It features a very light adhesive, which doesn't leave behind a sticky residue once peeled off. The instructions state it should be peeled off after every use, but provided that it's not used in very hot conditions, it's good for at least a couple of trips out. **CMR**



Think Tank Photo Urban Approach £81

WWW.THINKTANKPHOTO.COM

Think Tank has just released a new series of Urban Approach backpacks and messenger bags for mirrorless cameras. The messenger bag comes in two different sizes: 5 and 10. The former will house up to a large-sized CSC with lens attached, plus up to three extra lenses and a 8in tablet, while the 10 has space for an additional lens and a 10in tablet.

The styling is minimal, with an entirely black exterior, matt black leather accenting across the front, and a durable woven nylon fabric on the front flap and underside. The bag is also coated in a waterproof DWR (durable water-repellent) coating, though there's also a seam-sealed rain cover in case users get caught in the rain.

Two large dividers spit the main compartment into three, with extra, small Velcro dividers allowing users to store multiple lenses in each section. There's

space for a tablet at the back, while the front has a large pouch that's ideal for accessories and personal belongings.

Though not extensively padded, the Urban Approach bag does a reasonable job of protecting kit. It's comfortable to carry over one shoulder, and the strap is soft and breathable. The bag easily held an Olympus OM-D EM-5 Mark II with a small prime attached, plus three small primes and a pro zoom. It's of exceptional quality and clearly built to last. **CMR**



PROS CONS

- Ergonomic
- Useful dividers
- Built to last

CONS

- Not quite as heavily padded as some rivals



Canon Lens Guru FREE

WWW.CANON.CO.UK

You'd be forgiven for thinking the Canon Lens Guru app is solely about lenses – just from its name – but it turns out to be about quite a bit more than that. In fact, it's an extremely useful app for all amateur photographers, especially those who are just starting out. The opening section is a learning hub, which has downloadable video tutorials on various aspects of photography. These include guides on macro, portrait, sports and wildlife, among other things. The second section has example pictures of varying subject matter, with the app informing users which lenses would be ideal for capturing these types of images.

The final section is a guide on lenses that are available from Canon: landscape, macro, architecture and more. For those looking to

invest in new glass for their Canon DSLR system, it's useful to get an overview of what's out there and get the assurance of exactly what you need.

Equally, for any other DSLR owners, regardless of brand, the app still teaches fundamentals about what kit is best suited for what situations. While the acronyms **may** not be the same, similar functions **will be** available on lenses from other manufacturers. The **app is free and available on both Android and iOS devices from either the Apple App or Google Play stores.** **CMR**

PROS CONS

- Comprehensive tutorials on many aspects of photography

CONS

- Not very much at all





Compact and solidly built, the M3 has a well-proportioned, secure handgrip



CANON EOS M3 £599

WITH 18-55MM F/3.5-5.6 LENS

The EOS M3 looks set to shake up the the enthusiast CSC market

WWW.CANON.CO.UK • TESTED BY ANDY WESTLAKE

The EOS M3 marks a new direction for Canon's range of CSCs, as it is aimed very clearly towards the enthusiast photographer. The M3 is built around a sensor found in both the Canon EOS 750D and 760D DSLRs. Although this 24MP sensor is certainly welcome in a CSC, it unfortunately lacks the dual-pixel focus technology found in some more advanced Canon DSLRs. Instead, the M3 has a 49-point hybrid AF system with on-sensor phase-detect pixels, which should mean an improved AF performance.

While some CSCs now offer Ultra-HD 4K video capture, the M3 makes do with conventional full HD 1920 x 1080 recording at 30, 25 or 24fps. It does offer built-in stereo mics, however, and a 3.5mm jack. Its 3in, 1,040k-dot touchscreen is hinged – as opposed to completely vari-angle – while an EVF is an optional extra. Finally, the camera has Wi-fi and NFC connectivity for use with a smartphone or tablet, and features an IR receiver for traditional remote control.

The design of the camera has also seen a complete rethink. The body is distinctly compact, yet solidly built with a secure handgrip. This combination makes the M3 arguably one of the best-handling CSCs in its class; the general layout of the physical controls of dials and buttons is well thought out – akin to that on Canon's mid-range DSLRs. Similarly, the touchscreen will feel natural to smartphone owners.

KEY SPECS

SENSOR

24.2MP APS-C CMOS

FILE FORMATS

JPEG, Raw,

Raw+JPEG

DISPLAY

Tilt-type 3in, 1,040,000-dot LCD touchscreen

ISO RANGE

100-12,800 (expandable to ISO 25,600)

EXPOSURE MODES

PASM, Scene Intelligent Auto, Creative Assist, Hybrid Auto, Scene, Creative Filters, Custom

BURST

4.2fps

MOVIE MODE

1920 x 1080p Full HD at 30fps

DIMENSIONS

110.9 x 68.0 x 44.4mm

WEIGHT

366g with battery and card

The only real disappointment is the 18-55mm kit lens, which, while sharp, is bulky compared to its rivals.

The original EOS M struggled with focusing speeds but the M3 is a big improvement. Though it still might not be as quick as some rivals, it acquires focus promptly and, though it can struggle with moving targets, is generally accurate.

If you're looking to utilise Canon's EF and EF-S mount lenses then you'll have to purchase the EF-EOS M mount adapter. It works perfectly well with newer STM lenses, but with older lenses there's a noticeable slowing of focusing.

Start-up is almost instant, although there is a slight shot-to-shot delay which could, in some instances, lead to missed images. Meanwhile, its 4.2fps continuous shooting rate is respectable, though some way behind competitors. It's also hampered by the inability to use live view while shooting in this mode, as well as being further slowed by the usage of tracking AF.

The high megapixel count delivers a good level of resolution and image quality is very good. Noise is a mixed picture. The ISO range is 100-12,800, expandable to 25,600, and there are excellent results up to ISO 400. Images are usable up to ISO 3200 and just beyond, but at the highest ISOs, images really suffer. Finally, the M3 does lag a bit behind rivals with regards to dynamic range – you won't be able to bring too much detail back from shadows and highlights.

Verdict

The EOS M3 is compact, well made, and a pleasure to use. The autofocus speed is vastly improved, though it still lags behind notable rivals. Images are impressive, with the sensor delivering bags of detail and low noise at lower ISOs. But it has a relatively slow burst mode and small buffer, while the kit lens is bulky compared to the competition, though optically very good. So, though a huge improvement, the M3 doesn't outperform its rivals.

BEST FOR

- Overall image quality
- Existing EOS owners, due to familiarity of the controls
- Using Wi-fi and NFC for sharing images on smartphones

PROS

- Excellent design and user interface
- Pleasing image quality
- Huge improvement on predecessor

CONS

- Focusing speed and continuous shooting still behind competition
- Lacks built-in viewfinder
- Relatively bulky kit lens

FEATURES

17/20

PERFORMANCE

17/20

DESIGN

18/20

IMAGE QUALITY

18/20

VALUE

17/20

WDC RATING





The tilting LCD screen makes it easy to shoot from different angles, such as this low-level shot



This ISO 2500 image retains punchy colour and bags of detail



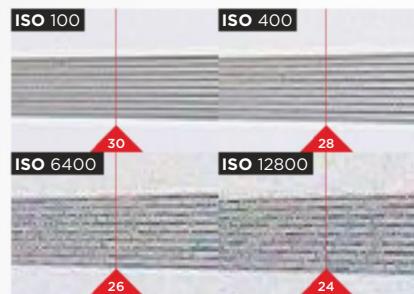
The new sensor can resolve detail plentifully, with attractive colour rendition

Image quality



COLOUR

In terms of colour, the Canon EOS M3 gives an impressive performance. JPEGs untouched out of the camera offer a punchy colour palette, while the auto white balance performance is also pleasingly reliable.



RESOLUTION

The M3 delivers a good level of resolution. Owing to its anti-alias filter, it doesn't capture quite the same level of sharpness as some rival 24MP APS-C sensors, though the filter means there is less chance of artefacts.

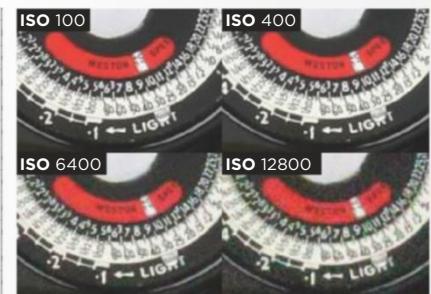


IMAGE NOISE

There is little visible noise up to ISO 400. At ISO 800 noise begins to appear, though up to ISO 3200 and just beyond is usable. But at the highest ISOs, careful processing is needed from Raw files for usable results.



The smallest DSLR in its class, the K-S2 boasts impressive in-body image stabilisation

PENTAX K-S2 £939 BODY ONLY

Pentax's latest mid-range DSLR model is affordable yet well-specified

WWW.RICOH-IMAGING.CO.UK • TESTED BY ANDY WESTLAKE

Although numerical conventions would suggest that the Pentax K-S2 is a replacement for the entry-level K-S1, its specification reveals a more advanced camera, replacing the K-50. As a result, the K-S2 is up against some fairly stiff competition – the Nikon D5500 and Canon 750D on the DSLR side of things, while the Olympus E-M10 and Sony A6000 are also sure to share similar space on stockists' shelves. But a glance at the full specification reveals you're getting a lot for your money.

The K-S2 has a 20.1MP APS-C CMOS sensor which boasts an impressive ISO range of 100-51,200 and has had the low-pass filter removed for maximum sharpness. Any concerns about moiré and alias patterning are managed through the presence of an anti-alias filter simulator provided by the built-in image-stabilisation system. This stabilisation is itself impressive – providing 3.5 stops of benefit and working with almost any lens.

While the LCD is solid at 3in and 921k dots, the viewfinder is a tad more impressive. Unlike a lot of its competition, the K-S2's viewfinder offers 100% coverage. Also, as it's the pentaprism type (rather than the pentamirror type) it remains bright despite its larger size. Other features include in-camera Raw processing, HD video capture and built-in Wi-fi and NFC connectivity.

While the top-plate of the Pentax K-S2 appears metal, it is a cosmetic

KEY SPECS

SENSOR

20.12MP APS-C CMOS

FILE FORMATS

JPEG, Raw, Raw+JPEG

DISPLAY

3in, 921k-dot, vari-angle LCD

ISO RANGE

100 to 51,200

EXPOSURE MODES

PASM, Auto Picture modes, Scene, Advanced HDR

BURST

5.4fps

MOVIE MODE

1920 x 1080 Full HD at 30p/25p/24p

DIMENSIONS

122.5 x 91 x 72.5mm

WEIGHT

678g with battery and card

addition, with the body mainly plastic. Despite this, the K-S2 still feels solid in the hand and benefits from a weather-resistant build.

The most striking element of the camera's design is the substantial handgrip. It's nearly 7cm deep and will feel bulky in all but the largest of hands. After some getting used to, this does begin to feel familiar, however, those with smaller hands are advised to try handling it first.

The K-S2 also inherits one of the most useful Pentax DSLR features – the d-pad can be toggled to control a range of camera functions including ISO, drive mode and white balance, while a selection of other controls feature dedicated buttons around the camera body.

The K-S2's AF configuration is some way behind its rivals. The 11-point AF set-up is certainly superseded by the 19-point set-up found on the EOS 760D or the 39-point system on the Nikon D5500, although it still performs perfectly well on static subjects. AF performance in Live View mode is more impressive, being powered by a contrast-detect set-up.

The K-S2 comes with a collapsible 18-50mm kit zoom. This keeps the package nice and small, but optically, the lens is not great, especially at telephoto.

In general use, the K-S2 is perfectly snappy with no noticeable power-up or shot-to-shot delay, while the controls and menu system are all intuitive and make for a pleasing user experience.



Verdict

In a competitive class the K-S2 is one of the most pleasing DSLRs to use thanks to the large viewfinder and impressive control set-up. While the large handgrip might not suit all users it should grow on you, while the image quality is good in JPEG mode and excellent when shooting Raw. Throw in the extensive range of compatible Pentax K mount lenses and you've got a camera that's excellent value and is one of the best in its class.

BEST FOR

- Enthusiast users who want to take creative control
- Those who like lots of external controls and customisation
- High ISO performance

PROS

- Wide range of physical controls
- Comprehensive in-body image stabilisation
- Generous viewfinder

CONS

- Lacking a touchscreen
- JPEG image quality not great
- Handgrip on the large side

FEATURES

19/20

PERFORMANCE

17/20

DESIGN

18/20

IMAGE QUALITY

18/20

VALUE

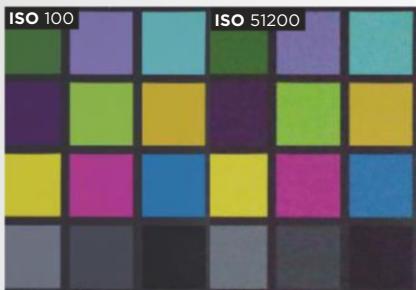
19/20

WDC RATING



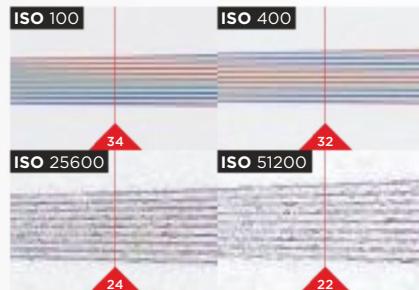


Image quality



COLOUR

Auto white balance is reliable on the whole, though it does err on the cool side at times. In this instance, it's better to set your own white balance setting, though you can always shoot Raw and convert in camera.



RESOLUTION

As you might expect for a 20MP camera with no anti-alias filter, the K-S2 can resolve plenty of detail. As the ISO settings increase, the K-S2 maintains an impressive level of detail compared to similar DSLRs.

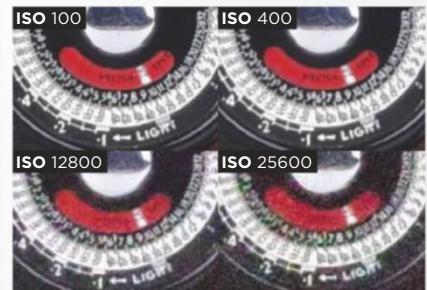


IMAGE NOISE

The K-S2 manages image noise at high ISO settings impressively. At the lowest sensitivities, fine detail is well presented and noise is largely absent up to ISO 1600, and only the top two settings are best avoided.

Tamron

SP 15-30mm f/2.8 Di VC USD £950



Opening the lens to f/2.8 helps to blur the background and offers an opportunity to experiment with depth of field

Is Tamron's latest wide zoom the ultimate wideangle lens for serious photographers?

WWW.TAMRON.EU • TESTED BY MICHAEL TOPHAM

Late last year, while attending the Photokina trade show, I got my hands on the very first sample of Tamron's new wideangle zoom - the SP 15-30mm f/2.8 Di VC USD. Though the wideangle lens market is already crowded, this is the first wideangle zoom with both a constant f/2.8 aperture and optical stabilisation.

Features

While primarily designed for use with full-frame cameras, the Tamron SP 15-30mm f/2.8 Di VC USD can be used on APS-C models, too. On an APS-C camera it becomes more of a standard zoom than a wideangle, with a 22.5-45mm equivalent range. But since most people will be looking at this lens for its wideangle benefit, I will be testing it on a Canon EOS 5D Mk III full-frame DSLR, with which it provides a 110°32'-71°35' angle of view.

The Tamron uses 18 elements in 13 groups and has an expanded glass moulded aspherical element within the front group - the first of its kind to be found in a Tamron lens. Its

purpose is to control aberrations and enhance sharpness while working in tandem with several low-dispersion glass elements. To protect the lens from unwanted reflections and ghosting, Tamron has used special eBAND nano-structured coatings, and the lens has an Ultrasonic Silent Drive (USD) motor to ensure autofocus

operation is as quiet and as accurate as possible. It can focus within 28cm

(11in) of a subject, which is the same distance quoted by Canon and

Nikon's f/2.8 wideangle zooms.

Some photographers may question the benefit optical stabilisation brings to a zoom so wide and to a lens that's most likely to be coupled to a camera mounted on a tripod. But for those who prefer to work handheld or anyone using their camera where a tripod or monopod can't be used, optical stabilisation could make all the difference for capturing a pin-sharp shot rather than a blurred one. Tamron has decided against specifying the number of stops the VC system is effective to, but out in the field I had no difficulty shooting sharp images with slow shutter speeds, and with the camera braced against my body I achieved sharp shots with a shutter speed as slow as 1/2sec at its widest 15mm setting.

The lens boasts an Ultrasonic Silent Drive motor for quiet and accurate autofocus



Build and handling

On picking this lens up, you realise how chunky it is. It's 130g heavier than Nikon's AF-S Nikkor 14-24mm f/2.8G ED, and a hefty 465g heavier than Canon's EF 16-35mm f/2.8L II USM. The extra weight contributes

to a solid feel, though. From its well-grooved rubberised zoom and focus rings to its permanently attached lens hood, everything feels well made, meaning build quality feels on a par with its closest rivals.

The zoom functions across its range in less than a quarter of a turn of the zoom ring for fast operation, despite the fact it has more resistance than the manual-focus ring, which operates more fluidly. The buttons sit quite flush to the barrel with only a slight protrusion.

From behind the camera and with the left hand supporting the lens beneath, the vibration-compensation switch falls to the thumb nicely, but the AF/MF switch is positioned higher and requires a good stretch of your thumb around the barrel to reach it. During testing, I often had to take my eye away from the viewfinder to find the AF/MF switch rather than being able to find it quickly by feel. The way the fixed petal hood protrudes beyond the bulbous front element offers excellent protection to the glass from any knocks when it's carried across the shoulder. The felt-lined lens cap gives further protection and is the push-fit type as opposed to the more traditional pinch-style.

Image quality

For its price, you'd expect first-class image quality and this is exactly what you get. The results from our thorough testing – both out in the field and back in the lab – suggest that Tamron's engineers have worked hard to ensure this.

Opening the lens to its f/2.8 maximum aperture reveals a drop-off in sharpness in the corners, but by the time the aperture is stopped down to f/5.5-6, edges start to appear much sharper, with the ultimate sweet spot found between f/8 and f/11 at 15mm. At f/16, diffraction does begin to blur the image a little and becomes more pronounced at f/22. In the middle of the zoom range (24mm) good sharpness levels are obtained between f/5.6-f/11, while at the 30mm end an aperture setting of f/11 delivered the best results.

For a zoom so wide and so fast, I half expected vignetting to be an issue; but it's not as obstructive as I'd envisaged, and although corner shading is evident at f/2.8-4.5 when the lens is set to its widest focal length, it gradually disperses as the

“It's excellent value for money when you consider its overall performance and stabilisation”

aperture is closed towards f/5.

A close inspection along high-contrast edges where chromatic aberrations can appear revealed traces of purple and green fringing. However, this was only obvious when an image was viewed at 100% or closer, and isn't intrusive or obvious in general viewing. As for the way the lens renders straight lines, there is evidence of barrel distortion at the widest focal lengths, while at 30mm straight lines also appear to bow outwards, indicating the lens does exhibit some pincushion distortion.

Our verdict

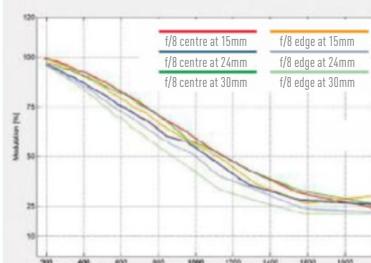
There's a lot to like about the Tamron SP 15-30mm f/2.8 Di VC USD, and it's the only wideangle zoom with image stabilisation

and an f/2.8 aperture. Although it's by no means cheap at £950, it's excellent value when you consider how well it performs and the way it offers vibration compensation – a feature neither the more expensive Canon EF 16-35mm f/2.8L II USM (£1,120) nor Nikon's AF-S Nikkor 14-24mm f/2.8G ED (£1,315) provide. Tokina's AT-X 16-28mm f/2.8 Pro FX (£650) is also worthy of a mention, but its zoom range is slightly smaller, the overall finish isn't quite as refined as the Tamron and it too doesn't provide optical stabilisation. I was extremely pleased by the all-round performance of the Tamron, barring the positioning of the AF/MF switch. It should appeal to full-frame photographers specialising in landscape, interior or architectural photography. If you're in search of optical stabilisation from a wideangle zoom or like the idea of attempting shallow depth of field wideangle photography, this is the lens for you.

Lab Tests

RESOLUTION

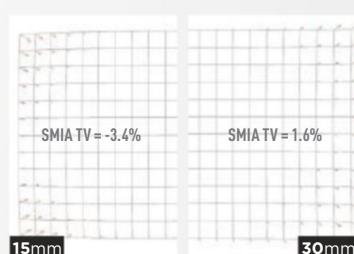
The best centre and corner sharpness is found between f/8-11. Use the lens at its maximum aperture set to its widest focal length, and the corners do appear softer than the centre.



It's possible to focus as closely as 28cm to a subject – standard for a wideangle lens of its type

CURVILINEAR DISTORTION

At 15mm barrel distortion is evident in images. As the zoom is extended towards 24mm, this becomes less distinct, but our distortion chart did reveal some pincushion distortion at 30mm.



KEY SPECS

FILTER DIAMETER	N/A
LENS ELEMENTS	18
GROUPS	13
DIAPHRAGM	
BLADES	9
APERTURE	f/2.8
MINIMUM FOCUS	28cm
LENGTH	145mm
DIA METER	98.4mm
WEIGHT	1.100g
LENS MOUNT	Canon, Nikon, Sony

PROS

- Overall image quality
- Build quality
- Constant f/2.8 aperture
- Optical stabilisation

CONS

- Some barrelling and pincushion distortion
- Sharpness between f/16-f/22
- Quite heavy



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The distance learning was very helpful to me as I cannot commit to regular days in the week. I enjoy the feedback, which is honest and fair but constructive.

Lee Hyett-Powell
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Panasonic Lumix 30mm f/2.8 G Macro Lens £299.99

Affordable macro lens for Micro Four Thirds users

WWW.PANASONIC.COM • TESTED BY RICHARD SIBLEY

Small and affordable, the new Panasonic 30mm f/2.8 macro lens is perfectly scaled for use on most Micro Four Thirds cameras. The focal length is the equivalent of 60mm on a full-frame camera, so it doubles up as a standard lens for things like portrait images and landscapes.

Externally, there is little to shout about. It has the usual Panasonic finish, with a fairly large ribbed fly-by-wire focus ring. Internally, there are nine lenses in nine groups, with a single aspherical lens, as well as the stabilisation motors. Meanwhile there are seven aperture blades in a circular formation.

When shooting general images, Panasonic users can make use of the lens's MEGA OIS to help prevent camera shake, while Olympus users will have the choice of either the in-lens stabilisation, or their in-camera stabilisation. I found the lens stabilisation offered some three extra stops of shutter speed, but when shooting macro images, slight movements are hugely exaggerated, so even with stabilisation you will need a fast shutter speed.

Since minimum focus is always measured from the rear of the lens, the 10.5mm distance that is needed to achieve a 1:1 image with this lens means having the front of the lens about 2cm from the subject. This may cause problems with shadows and lighting, and if photographing insects, you may find it hard to get that close without scaring them off.

For its price, the lens's image quality is very hard to fault. With the advantage of the 4:3 aspect ratio, the edges are reasonably sharp and vignetting is virtually non-existent. At f/2.8 the centre of the frame is certainly sharp enough in most of my macro images, though I did get

The 30mm doubles up as a fairly standard focal-length lens for general use



slightly sharper results at f/8.

Wide open, the out-of-focus areas are lovely and blurred. Specular highlights remain circular even when the lens is stopped down to f/8, but at f/11 the shape starts to become more heptagonal, though it is obviously a little less noticeable due to the highlights being smaller.

Most Compact System Cameras will fix lens flaws in-camera, and when used with a Panasonic Lumix camera, lens flaws such as vignetting can be corrected in JPEGs. There is even some correction of Raw files. All of this results in very good images that need little, if any correction.

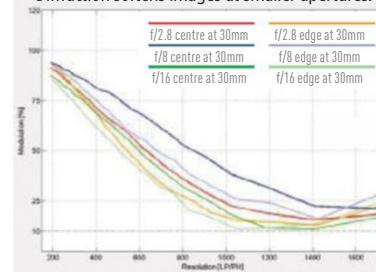
As a standard focal length lens, the 30mm f/2.8 performs well. Images are good, with a nice level of detail, but the 60mm-equivalent focal length, sitting between 50mm and 85mm, doesn't quite give the same effect as either. It's a good option for those starting out, but if you want to take your macro images to the next level, particularly if you plan to photograph insects, the 30mm may not be the answer.



Lab Tests

RESOLUTION

The 30mm provides consistent sharpness across the frame at all apertures. It's a little soft wide open and overall it is sharpest at f/5.6-f/8. Diffraction softens images at smaller apertures.



CURVILINEAR DISTORTION

Very low distortion is shown. Unusually for Micro 4/3, Raw and JPEG files have identical results, which means no corrections are applied in camera.



KEY SPECS

FILTER DIAMETER	46mm
LENS ELEMENTS	9
GROUPS	9
DIAPHRAGM BLADES	7
APERTURE	f/2.8 - f/22
MINIMUM FOCUS	10.5cm
LENGTH	63.5mm
DIAIMETER	58.8mm
WEIGHT	180g
LENS MOUNT	Micro Four Thirds

PROS

- Very good image quality
- Affordable price
- Compact size
- Lens stabilisation
- Can double as a standard lens

CONS

- Photographing insects is difficult
- Wide angle of view gives excessive background in images

WDC RATING



Compact or System camera?

Which camera type is best for you? A simple compact that fits in a pocket, a premium or travel compact that's more advanced, or a system camera that has interchangeable lenses and more user control, such as a CSC or DSLR? We help you decide...

All digital cameras are based around the same theory; use a light-sensitive sensor to capture light, then process the result and save it onto a memory card. Beyond that, the functionality can vary wildly from model to model, from touchscreen controls to HD video and wide-aperture lenses differentiating one model from another.

Digital cameras fit into three distinct categories: compact camera, Compact System Camera (CSC) and Digital Single Lens Reflex (DSLR) cameras. All three have sub-genres within them, but there are other obvious qualities which set them apart.

Compact cameras have a fixed lens, which can't be removed and changed. This means that the lens becomes a feature in itself, with some of them starting at a particularly wide focal length, or reaching out much further than others (or both), and others having

wide maximum apertures which prove their worth in low light and for controlling depth of field.

Manual controls, the ability to record HD video and a large, high-resolution display or viewfinder are just a few of

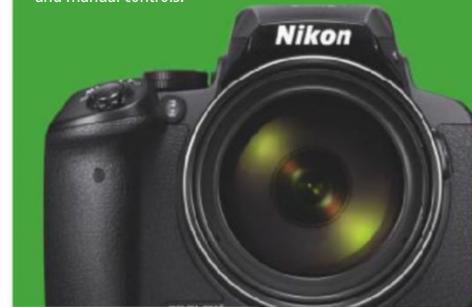
many other features that can be had when more money is spent.

Within the compact camera genre are the likes of bridge, or 'superzoom' models, which offer a far longer zoom lens and a body shape akin to that

of a DSLR, together with manual control over shutter speed and aperture. While they can be used more creatively than regular compacts, their small sensors (relative to DSLR and CSC cameras) place restrictions on

Compact

Small camera, generally pocket sized, with non-removable zoom lenses. Designed for convenience more than image quality, though some premium models feature larger sensors and manual controls.



PROS

Small, Affordable, No additional lenses required, Pocketable, Less intimidating to use than DSLRs

CONS

No option to change lenses for specific purposes, Small sensors not suited to all conditions

Bridge camera

Looks like a DSLR but is actually a compact with a high-magnification zoom lens in a DSLR-shaped body – usually incorporating a large hand-grip and often a viewfinder.



PROS

Long zooms, All-in-one design, Manual controls

CONS

Generally small sensors are no match to DSLR quality, Build quality can be more plasticky than a DSLR

Jargon Buster

Compact System Camera (CSC)

Cameras which offer interchangeable lenses while omitting the viewfinder and mirror box construction common to DSLR cameras. These include Sony's NEX series and Olympus's PEN range, as well as Nikon's 1 system and Samsung's NX line of models.

Digital Single Lens Reflex (DSLR)

A digital SLR camera, which is constructed around a mirror-box and pentamirror/pentaprism assembly, such as the Canon EOS 700D and Nikon D5300. These are popular among beginners, enthusiasts and

professionals, thanks to their wide compatibility with different lenses, manual control over exposure and ergonomics.

Compact camera

A small camera whose lens cannot be removed, in contrast to interchangeable-lens cameras such as DSLRs. These are often cheaper than CSC and DSLR cameras, although they usually have more limited functionality and smaller sensors.

Aperture

The aperture of a lens refers to the size of its opening which allows light through to the camera. This is created by a series of

blades inside the optic, and is usually regulated through the camera body, although some older lenses have physical aperture rings around their barrels. An aperture of f/2 or f/2.8 is classed as being large (or wide) because the opening itself is larger than those created by higher-number apertures such as f/16 or f/22.

Shutter speed

The length of time that the shutter inside the camera is open, exposing the sensor to light. Longer shutter speeds let in more light, and so are often required in low-light conditions, or when the intention is to blur certain elements in the scene. Faster shutter

speeds are ideal for freezing motion, such as when photographing sports.

Display

The rear panel on the back of a camera which shows captured images and videos, as well as the live feed from the sensor. These are usually TFT LCD types, although some cameras now make use of Organic Light Emitting Diode (OLED) alternatives. Resolution is usually specified in dots: compact camera displays often have 230k or 460k dots, while those displays that are on high-end enthusiast compacts, CSCs and DSLRs are usually 921k dots or even higher.

the kind of image quality that can be achieved.

CSCs

CSCs fit somewhere between compacts and DSLRs, with the benefit of a small-format body and interchangeable lenses. Due to their mirrorless designs, optical viewfinders are exchanged for electronic variants that continue to get better all the time in terms of their resolution and sharpness.

Due to the lack of an established form factor, unlike DSLRs, CSCs come in a wide variety of shapes and sizes. Most differences are aesthetic, but a fair few affect the handling quite significantly too. Some models have thin, wide bodies, while others are shaped like DSLRs to provide more to wrap your hand around.

DSLRs

DSLRs range from beginner models, such as the Canon EOS 1100D, up to professional level models, such as the same company's EOS-1D X. The body shape is similar throughout, with a large hand grip and dials on the top, although most professional DSLRs are more square than rectangular, with additional shutter release buttons and dials to make portrait-orientation shooting comfortable.

The addition of an optical viewfinder is one of the unique features that differentiates a

CSC

An interchangeable-lens camera with no optical viewing assembly but either an electronic one, or just the LCD screen to shoot with. CSCs come in a wide variety of forms with a wide range of sensor sizes, so image quality varies greatly between models.



PROS

Typically smaller than DSLRs, HD video, Interchangeable lenses, Great image quality for the size

CONS

Optical viewfinders usually not available, Lens ranges, Premium models can be expensive

DSLR

The choice of professionals, a DSLR features interchangeable lenses, plus an optical viewfinder that sees what the lens sees thanks to a 45° mirror and prism assembly inside the camera. The bulkiest camera type, but the full frame models deliver the highest image quality.



PROS

Interchangeable lenses, Manual exposure control, HD video, Excellent ergonomics

CONS

Large and heavy bodies, Expensive, Poor-quality kit lenses often supplied as standard

DSLR model from most CSCs and compact cameras.

The only models that buck this trend, and as a result can't quite be described as true DSLRs, are those in the Sony SLT range, whose models include the A58 and A77. The SLT construction uses a translucent mirror which means it does not need to move in order for light to pass through to the sensor, in contrast to DSLRs which flip their mirrors up at the point of exposure. As a result the burst rate is faster; with the likes of the A77 able to shoot at up to 12fps. The disadvantage, depending on

your preference, is the presence of an electronic, rather than optical, viewfinder.

There are essentially two kinds of sensor used in DSLRs: APS-C and full frame, although full frame sensors are starting to creep into some CSCs such as the Sony Alpha 7 and 7R.

Full frame is described as such because it's roughly the same size as a 35mm negative. APS-C sensors are smaller, and as a result they only use the central part of a lens, which in turn increases their effective focal length (reducing the angle of view). This is known as a 'crop factor'. Full frame lenses

do not apply a crop factor to lenses, and so they maintain the same angle of view and focal length as if they were used on a film SLR.

DSLRs and CSCs also attract the attention of videographers, given the proliferation of HD video functionality and the range of lenses available. Many DSLRs – particularly those aimed towards a more discerning audience – also now incorporate ports for external microphones and have a full complement of options for different frame rates and output options as well as control over audio recording.

Optical viewfinder

A viewfinder which relies on an optical, rather than electronic, construction. DSLRs are equipped with optical viewfinders, which present the view through the lens. Those on cheaper DSLRs are constructed with a hollow chamber with mirrored sides (penta-mirrors) while those on pricier models feature a ground glass prism (pentaprism) which is brighter.

Electronic viewfinder (EVF)

An electronic alternative to an optical viewfinder. These are typically integrated into bridge cameras and some Compact System Cameras, where an optical

viewfinder is either not possible or less desirable. More recent EVFs are constructed from OLED panels rather than LCDs, and some of these are surprisingly detailed and bright.

Sensor size

The physical size of the sensor inside a camera. Cameras with larger sensors often produce better-quality images than those with smaller ones, as each photosite is larger. A larger capacity allows its signal-to-noise ratio to be higher; as a result images stand a better chance of having a wider dynamic range and of being less affected by noise.

ISO

Also known as 'sensitivity', the ISO range of a camera determines its latitude for capturing images in different conditions. For a given camera, images captured at lower sensitivities generally contain less noise than those captured higher up, as the signal from the sensor – which contains unwanted noise – requires less amplification.

Burst rate

The speed at which a camera can fire consecutive frames, given in frames per second (fps). Many recent cameras have a standard fps rate which captures at the sensor's full resolution, with further faster

options which output images at a reduced pixel count. Often a camera's fastest burst mode will only be possible with focus and exposure taken from the first frame.

Neutral Density (ND) filter

ND filters are commonly used with DSLR cameras, although some enthusiast compacts now have these integrated into their lenses. Their purpose is to reduce exposure times, so that longer shutter speeds can be used, with the 'neutral' part of their name signifying that they are designed to have no effect on the colour balance of an image.

Camera Listings

If you want maximum control over your creative shooting options, you want an interchangeable-lens camera, whether a DSLR model or a Compact System Camera model. Here we list and rate all the models on the market

DSLRs

NAME & MODEL	RRP	TESTED	SCORE	SUMMARY	SENSOR	LENS	MAX ISO	VIDEO	Stereom. input	AF Points	Burst mode (fps)	Viewfinder (%)	Built-in Wi-fi	Built-in GPS	Flash	SCREEN	Articulated (D) Touchscreen	Battery life (shots)	Width (mm)	Height (mm)	Depth (mm)	Weight	
Canon EOS 1200D	£450	06/14	4★	Entry level update to Canon's 1100D, the 1200D excels in the key areas of AF speed and accuracy while ISO performance is good	16MP	Canon	12,800	1080p		9	3	95				•	3in		500	129.6	99.7	78	480g
Pentax K-500	£450	10/13	4★	Stripped-down version of K-50 without weather sealing boasts 100% glass prism viewfinder; uses AA batteries	16.3MP	Pentax	51,600	1080p		11	6	100				•	3in		410	130	97	71	646g
Sony Alpha 58	£450	07/13	4★	Replacement for A57 boasts Bionz image processing engine, OLED viewfinder, plus 20MP sensor – up from 16MP	20.1MP	Sony	16,000	1080p		15	5	100				•	2.7in	•	690	129	95.5	78	492g
Pentax K-S1	£550	03/15	4★	The fully-specified K-S1 boasts excellent image quality, while still being a lightweight, compact and portable option	12.1MP	Pentax	51,200	1080p	•	11	54	100				•	3in		tbc	92.5	120	69.5	498g
Pentax K-S2	£550	07/15	4.5★	Launched as the world's smallest dustproof, weather-resistant DSLR, the K-S2 boasts a vari-angle LCD and built-in NFC	20.1MP	Pentax	51,200	1080p	•	11	54	100	•			•	3in	•	410	122.5	91	72.5	678g
Canon EOS 750D	£599	NYT		A new addition to the EOS line-up, the 750D is designed for EOS newcomers, with a non-threatening layout	24.2MP	Canon	25,600	1080p		19	5	95	•			•	3in	•	440	131.9	100.7	77.8	555g
Nikon D3300	£600	04/14	4.5★	Nikon's new entry-level DSLR is smaller than previous offerings while a sensor with no anti-aliasing filter means detail is high	24.2MP	Nikon	25,600	1080p	•	11	5	95				•	3in		700	124	98	75.5	460g
Pentax K-30	£600	03/14	4★	Stellar image quality make this a welcome alternative to Canon, Nikon and Sony offerings at the price	16.3MP	Pentax	25,600	1080p		11	6	100				•	3in		410	96.5	128.5	71.5	660g
Pentax K-50	£600	10/13	4.5★	Replacement for K-30 offers 16MP sensor, weather sealing and improved processing. Still able to shoot at up to 6fps	16.3MP	Pentax	51,200	1080p		11	4	100				•	3in		410	130	97	71	650g
Canon EOS 760D	£649	NYT		A new addition to the EOS line-up, the 760D leans towards the aspiring enthusiast photographer	24.2MP	Canon	25,600	1080p		19	5	100	•			•	3in	•	440	131.9	101	77.8	565g
Nikon D3200	£650	07/12	4.5★	With a 24MP sensor and excellent Guide mode, this is the perfect entry-level DSLR. Wi-fi & GPS optional	24.2MP	Nikon	12,800	1080p	•	11	4	95				•	3in		540	125	96	76	505g
Canon EOS 100D	£650	07/13	4.5★	Billed as the world's smallest and lightest DSLR; kit lens is the company's EF-S 18-55 f/3.5-5.6 1:1.8 STM zoom. GPS optional	18MP	Canon	12,800	1080p	•	9	4	95				•	3in		380	117	91	69	407g
Nikon D5200	£720	03/13	4.5★	Inspired by the D500 and D7000, the D5200 has a vari-angle LCD, 24MP sensor and HD video. Wi-fi & GPS optional	24.1MP	Nikon	25,600	1080p	•	39	5	95				•	3in	•	n/a	129	98	78	555g
Nikon D5500	£720	04/15	4.5★	New DX-format DSLR in Nikon's 'Advanced beginner' range, updating the impressive D5300 and adding a touchscreen	24.2MP	Nikon	25,600	1080p	•	39	5	95	•			•	3.2in	•	820	124	97	70	470g
Canon EOS 60D	£750	09/12	4.5★	Still current in the company's DSLR range, this semi-pro design packs in an 18MP CMOS sensor and a vari-angle screen	18MP	Canon	25,600	1080p	•	9	5	96				•	3in	•	1,100	145	106	79	755g
Canon EOS 700D	£750	Web	4.5★	Update to 60D comes bundled with a new 18-55mm STM kit lens, that promises improved movie AF, GPS & Eye-Fi optional	18MP	Canon	12,800	1080p	•	9	5	95				•	3in	•	440	133	100	79	580g
Pentax K-3 II	£769	NYT		The weather-resistant K-3 II is the update to the flagship K-3 with a new GPS module and updated shake-reduction system	24.3MP	Pentax	51,200	1080p	•	27	8	100	•			•	3.2in		tbc	102.5	131.5	77.5	785g
Sony Alpha 65	£790	02/12	4.5★	Featuring the same sensor as the A77, the A65 can rattle off 10 frames per second and has a crisp electronic viewfinder	24.3MP	Sony	16,000	1080p	•	15	10	100	•			•	3in		440	132	98	81	543g
Nikon D5300	£830	01/14	4.5★	Update on the D5200 with large sensor, larger screen, HD video, and long lasting battery, should appeal to videographers	24.2MP	Nikon	25,600	1080p	•	23	5	95	•	•		•	3.2in	•	700	125	98	76	530g
Pentax K-5 II	£870	03/13	4.5★	Latest update to K-5 promises improved AF performance in low light and subject tracking with moving subjects	16.3MP	Pentax	51,200	1080p	•	11	7	100				•	3in		980	131	97	73	760g
Nikon D7200	£939	06/15	4★	Nikon's latest mid-range DSLR offers impressive new features over the D7100 it replaces at the top of Nikon's DX format range	24.2MP	Nikon	25,600	1080p	•	51	6	100	•			•	3.2in		1,100	135.5	106.5	76	765g
Pentax K-3	£950	01/14	4★	Upgrade from Pentax K-5. GPS optional. Impersonates a low pass filter. High FPS rate and is the first to carry Ricoh's name	24.2MP	Pentax	51,200	1080i	•	27	8	100				•	3.2in		560	131	100	77	800g
Sony Alpha 77 MkII	£1000	09/14	4.5★	With the mkII Sony has brought built-in Wi-Fi, great handling and enhanced AF that will suit sports and wildlife shooters	24.3MP	Sony	25,600	1080p	•	79	12	100	•			•	3in	•	480	142.6	104	81	647g
Canon EOS 70D	£1100	11/13	4.5★	World's first DSLR to boast Dual Pixel CMOS AF technology, giving the best autofocus performance for a DSLR during live view	20.2MP	Canon	12,800	1080p	•	19	7	98	•			•	3in	•	920	139	104	79	755g
Nikon D7100	£1100	05/13	4.5★	The D7100 updates the D7000 in several significant ways, and while not without fault it's still praiseworthy. Wi-Fi optional	24.1MP	Nikon	25,600	1080p	•	51	6	100	•			•	3in		950	135	106	76	765g
Canon EOS 7D MkII	£1599	01/15	4.5★	A better sensor and improved AF over the 7D; this is one of the best APS-C DSLRs for enthusiasts and pros. Wi-Fi optional	20.2MP	Canon	51,200	1080p	•	65	10	100	•			•	3in	•	670	148.6	112.4	78.2	910g
Canon EOS 6D	£1700	02/13	4.5★	Upgrades from D600: improved auto white balance, faster continuous shooting and a quiet continuous mode. GPS optional	20.2MP	Canon	102,400	1080p	•	11	45	97	•	•		•	3in		980	145	111	71	755g
Nikon D610	£1800	12/13	5★	Sony's full-frame A99 offers translucent mirror technology allied to a 19-point AF system with 11 cross sensors	24.3MP	Nikon	25,600	1080p	•	39	6	100				•	3.2in	•	900	141	113	82	850g
Sony Alpha 99	£1800	Xmas12	4★	The D750 is one of the very best all-round enthusiast DSLRs currently available with an impressive performance	24.3MP	Sony	25,600	1080p	•	19	10	100	•			•	3in	•	500	147	111	78	812g
Nikon D750	£1800	12/14	5★	Offering a massive 36MP, this is the camera to go for if you want to produce ultra-large prints. GPS optional	24.3MP	Nikon	51,200	1080p	•	51	65	100	•			•	3.2in	•	1,230	140.5	113	78	840g
Nikon D800	£2600	06/12	5★	Nikon's retro-tinted full-frame DSLR has a solid spec although it lacks a video mode. Overall, its images are superb	36.3MP	Nikon	25,600	1080p	•	51	4	100				•	3.2in		900	146	123	81	900g
Nikon DF	£2600	02/14	4★	Replacing the D800 and D800E, the DF is a truly welcome upgrade and one of the very best DSLRs on the market	16.2MP	Nikon	204,800	-		39	5.5	100				•	3.2in		1,400	143.5	110	66.5	765g
Nikon D810	£2699	11/14	5★	Removes the anti-aliasing filter of the D800 for even greater detail should you need it. GPS optional	36.3MP	Nikon	51,200	1080p	•	51	12	100	•			•	3.2in		1,200	146	123	82	980g
Nikon D800E	£2600	08/12	4.5★	An excellent full frame sensor, fast burst rate, high ISO range and advanced AF make this an impressive piece of kit. Wi-Fi optional	36.3MP	Nikon	25,600	1080p	•	51	4	100	•			•	3.2in		900	146	123	81	900g
Canon EOS 5D Mark III	£2999	06/12	5★	New full-frame DSLR that builds on the great success of its EOS 5D Mark III, which sports a world-first 50.4MP full frame sensor	22.3MP	Canon	102,400	1080p	•	61	6	100				•	3.2in		950	152	116	76	950g
Canon EOS 5DS	£2999	NYT		New 50MP full-frame DSLR, identical to the 5DS it was launched with except that it forgoes an optical low-pass filter	50.6 MP	Canon	12,800	1080p	•	61	5	100				•	3.2in		700	152	116.4	76.4	845g
Canon EOS 5DS R	£3199	NYT		Nikon's flagship DSLR, the D4S takes the best features of the D4 and improved the burst speed, AF and processing power	50.6 MP	Canon	12,800	1080p	•	61	5	100				•	3.2in		700	152	116.4	76.4	845g
Nikon D4S	£5290	Web	5★	A contender for the crown of best DSLR on the market, this camera is hard to fault. GPS & Wi-Fi optional	16.2MP	Nikon	409,600	1080p	•	51	11	100				•	3.2in		3,020	160	156.5	90.5	130g
Canon EOS-1D X	£5300	11/12	5★	A contender for the crown of best DSLR on the market, this camera is hard to fault. GPS & Wi-Fi optional	18.1MP	Canon	204,800	1080p	•	61	12	100				•	3.2in		1,120	158	163	82	110g

COMPACT SYSTEM CAMERAS

NAME & MODEL	RRP	TESTED	SCORE	SUMMARY	SENSOR	LENS	MAX ISO	VIDEO	SHOOTING				SCREEN	DIMENSIONS								
									Stroboscopic input	AF Points	Burst (fps)	Viewfinder	Built-in Wi-Fi	Built-in GPS	Flash	Articulated touchscreen	Battery life (shots)	Width (mm)	Height (mm)	Depth (mm)	Weight	
Sony Alpha 3000	£350	12/13	2.5★	Compact, affordable, and delivers DSLR-style results	20.1MP	Sony E	16,000	1080p	25	3.5	•				•	3in	480	128	91	84.5	353g	
Samsung NX3000	£350	10/14	4★	This may well be the best-value NX camera yet	20.3MP	Samsung	25,600	1080p	21	5	•				•	3in	•	370	117.4	66	39	266g
Panasonic Lumix GF6	£400	Web	4★	Newly developed Venus Engine and a 180° tilt screen	16MP	Mic4/3	25,600	1080p	•	23	20	•	•	•	•	3in	•	340	111	65	38	323g
Pentax Q7	£400	11/13	3★	Extra large sensor and improved AF	12.4MP	Pentax	12,800	1080p	25	5					•	3in		250	102	58	34	200g
Olympus PEN E-PM2	£400	Web	3★	Update to E-PM1 offers 16.1MP sensor	16.1MP	Mic4/3	25,600	1080p	•	35	8				•	3in	•	360	110	64	34	269g
Samsung NX Mini	£400	Web	4★	The light and compact NX Mini is very impressive	21MP	Samsung	25,600	1080p	35	6	•				•	3in	•	530	119	62	22.5	196g
Sony Alpha 5000	£420	Web	4★	Aims to compete with entry-level DSLRs	20.1MP	Sony	16,000	1080p	-	-	-				•	3in	-	110	63	36	296g	
Panasonic Lumix GF7	£429	Web	4★	A small and portable CSC that certainly impresses	16MP	Mic4/3	25,600	1080p	•	23	7	•	•	•	•	3in	•	230	106.5	64.6	33.3	266g
Nikon 1 J5	£429	N/T		The portable J5 is aimed at enthusiasts and has 4K video	20.8MP	Nikon 1	12,800	1080p	•	171	20	•	•	•	•	3in	•	250	98.3	59.7	31.5	265g
Sony Alpha 58	£450	05/14	4★	Replacement for A37 and A57	20.1MP	Sony	16,000	1080p	15	8					•	3in		700	128.6	95.5	77.7	573g
Nikon 1 S1	£480	Web	4★	User-friendly with an uncluttered interface	10.1MP	Nikon 1	6400	1080p	135	60	•				•	3in		220	102	61	30	197g
Olympus PEN E-PL5	£480	02/13	4★	One of the most competent CSCs at the price	16MP	Mic4/3	12,800	1080p	•	23	20	•	•	•	•	3in	•	360	110	64	34	261g
Olympus PEN E-PL7	£499	01/15	4★	High spec, compact size and superb image quality	16MP	Mic4/3	25,600	1080p	81	8	•				•	3in		350	114.9	67	38.4	357g
Nikon 1 J4	£499	11/14	4★	Excellent shooting speed and AF performance	18.4MP	Nikkor 1	12,800	1080p	•	171	20	•	•	•	•	3in	•	300	99.5	60	28.5	192g
Fujifilm X-A1	£500	12/13	4★	Virtually identical to X-M1, but with a standard sensor	16.3MP	Fuji X	25,600	1080p	41	5.6	•				•	3in	•	350	117	66.5	39	330g
Fujifilm X-A2	£529	Web	4★	Update to the X-A1, offering excellent value for money	16.3MP	Fuji X	25,600	1080p	49	5.6	•				•	3in	•	410	116.9	66.5	40.4	350g
Sony NEX-5T	£540	01/14	4★	APS-C sensor delivers DSLR results	16.1MP	Sony E	25,600	1080p	25	3	•				•	3in	•	330	111	59	39	276g
Sony Alpha 5100	£549	12/14	4★	One of the very best in class, in video and image quality	24MP	Sony E	25,600	1080p	179	6	•				•	3in	•	400	110	63	36	283g
Panasonic Lumix G6	£550	07/13	4.5★	DSLR-like performance and images	16MP	Mic4/3	25,600	1080p	•	23	7	•	•	•	•	3in	•	n/a	122	85	72	340g
Canon EOS M3	£599	07/15	4★	The M3 looks set to appeal to enthusiast photographers	24.3MP	Canon M	25,600	1080p	•	49	4.2	•	•	•	•	3in	•	250	110.9	68	44.4	366g
Samsung NX500	£599	06/15	4★	Same impressive sensor as the NX1 in a smaller camera	28.2MP	Samsung	51,200	4096p	205	9	•				•	3in	•	370	119.5	63.6	49.5	292g
Sony Alpha 6000	£670	06/14	4.5★	Class-leading AF and an impressive APS-C sensor	24MP	Sony	25,600	1080p	179	11	•				•	3in	•	310	120	67	45	344g
Fujifilm X-M1	£680	10/13	4★	Company's third CSC features X-mount lens mount	16.3MP	Fuji X	6400	1080p	54	5.6	•				•	3in	•	350	117	67	39	330g
Olympus OM-D E-M10	£699	05/14	4.5★	Maintains the high-end features of its OM-D siblings	16MP	Mic4/3	25,600	1080p	•	81	8	•	•	•	•	3in	•	320	119	82	46	396g
Canon EOS M	£700	XMAS12	4.5★	Shares much of its functionality with the EOS 650D DSLR	18MP	Canon M	25,600	1080p	31	4.3	•				•	3in	•	230	109	66.5	32	298g
Panasonic Lumix GM5	£749	01/15	4★	Small CSC with an electronic viewfinder	16MP	Mic4/3	25,600	1080p	•	23	5.8	•	•	•	•	3in	•	210	98.5	59.5	36	211g
Nikon 1 AW1	£749	12/13	3.5★	High-end CSC is waterproof and shockproof	14.2MP	Nikon 1	6400	1080p	41	15	•				•	3in		220	113	71.5	37.5	356g
Nikon 1 V2	£800	02/13	3.5★	Revamp for V1. Price includes 10-30mm kit lens	14.2MP	Nikon 1	6400	1080p	•	73	15	•	•	•	•	3in	n/a	109	82	46	277g	
Sony NEX-6	£800	01/13	4★	Excellent EVF and fast operation	16.1MP	Sony E	25,600	1080p	•	25	10	•	•	•	•	3in	•	360	120	67	43	287g
Olympus OM-D E-M5 mkII	£900	05/15	5★	Olympus's latest premium CSC boasts several improvements	16MP	Mic4/3	25,600	1080p	•	81	10	•	•	•	•	3in	•	750	123.7	85	44.5	469g
Panasonic Lumix GX7	£900	10/13	4.5★	With fast AF and tiltable EVF, delivers excellent results	16MP	Lumix G	25,600	1080p	23	40	•				•	3in	•	n/a	122.6	70.7	43.3	402g
Olympus PEN E-P5	£900	09/13	4.5★	No built-in EVF but has fast AF plus high quality images	16MP	Mic4/3	25,600	1080p	35	9	•				•	3in	•	330	122	69	37	420g
Samsung NX30	£900	Webonly	4.5★	A DSLR-style CSC with a burst rate of up to 8fps	21MP	Samsung	26,500	1080p	247	8	•				•	3in	•	360	127	96	58	375g
Fujifilm X-T1	£1100	4/12	5★	One of the best premium CSCs on the market	16.3MP	Fuji X	51,200	1080p	•	49	8	•	•	•	•	3in	•	350	129	89.8	46.7	440g
Panasonic Lumix GH3	£1120	XMAS12	5★	Responsive touchscreen and superb video mode	16MP	Mic4/3	25,600	1080p	•	23	6	•	•	•	•	3in	•	540	133	93.4	82	470g
Olympus OM-D E-M5	£1150	5/12	4.5★	The re-imagining of the classic Olympus OM	16MP	Mic4/3	25,600	1080p	•	35	9	•	•	•	•	3in	•	tbc	121	89.6	41.9	373g
Fujifilm X-E2	£1200	02/14	4.5★	Has over 60 improvements on the X-E1	16.3MP	Fuji X	25,600	1080p	•	49	7	•	•	•	•	3in	•	350	129	75	37	350g
Samsung NX1	£1299	02/15	5★	The first camera with an APS-C BSI sensor is impressive	28.2MP	Samsung	25,600	4096p	•	205	15	•	•	•	•	3in	•	tbc	138.5	102.3	65.8	550g
Panasonic Lumix GH4	£1300	07/14	4★	Both 4K video quality and still images are impressive	16MP	Mic4/3	25,600	4096p	•	49	12	•	•	•	•	3in	•	500	133	93	84	560g
Samsung Galaxy NX	£1300	10/13	4★	World's first 3G/4G Android CSC	20.3MP	Samsung	25,600	1080p	•	105	8.6	•	•	•	•	4.8in	•	-	137	101	26	495g
Olympus OM-D E-M1	£1300	12/13	5★	Fully weather-proofed and Wi-fi enabled	16.8MP	Mic 4/3	25600	1080p	•	81	10	•	•	•	•	3in	•	330	130	93.5	63	497g
Sony Alpha 7	£1300	01/14	4.5★	One of the lightest, smallest full-frame cameras	24.3MP	Sony E	25,600	1080p	•	117	5	•	•	•	•	3in	•	340	127	94	48	474g
Leica T	£1350	08/14	4★	Excellent image quality	16MP	Leica T	12,500	1080p	195	5	•				•	3.7in	•	134	69	33	384g	
Fujifilm X-Pro1	£1430	05/12	5★	Offers innovations including a hybrid viewfinder	16MP	Fuji X	25,600	1080p	49	6	•				•	3in		300	139	81.8	42.5	450g
Sony Alpha 7 II	£1498	03/15	5★	The full-frame A7 II is at the top of Sony's CSC range	24.3MP	Sony E	25,600	1080p	•	117	5	•	•	•	•	3in	•	350	126.9	95.7	59.7	556g
Sony Alpha 7R	£1700	02/14	4.5★	One of the lightest, smallest full-frame cameras	36.4MP	Sony E	25,600	1080p	•	25	4	•	•	•	•	3in	•	340	127	94	48	465g
Sony Alpha 7S	£2099	09/14	4.5★	The Sony Alpha 7S is the latest Sony full-frame CSC	12.4MP	Sony E	409,600	1080p	•	25	5	•	•	•	•	3in	•	380	127	94.4	48.2	489g

Lens Listings

A DSLR or Compact System Camera is hugely affected by the lens attached to the front, as the light hitting the sensor impacts focus, exposure and image quality. Cast your eyes over our lens listings to find out which is best for you before you make a purchase

BUILT-IN FOCUS MOTOR

Some lenses incorporate a motor within the lens to drive the autofocus, while others are powered by motors within the camera. The former will focus quicker than the latter. Canon lens motors are USM (Ultrasonic Motor), Sigma HSM (Hypersonic-Motor).

FILTER THREAD

In order to correct for colour casts or create more contrast, a screw-in filter can be used. The thread at the front of the camera will have a diameter, in mm, which will allow you to attach a variety of filters or adapters to the lens.



LENS MOUNTS

Each manufacturer has its own lens mount and most aren't compatible with one another. For example, a Canon DSLR can't use Nikon lenses, though you can use independent brands if you get them with the right mount.

MAGNIFICATION FACTOR

If you're changing from a 35mm SLR, your lenses won't provide the same field of view on a DSLR unless you have a "full-frame" model. So for Nikon, Pentax and Sony DSLRs, magnify the focal length by 1.5x to get a 35mm equivalent; for Canon 1.6x and Sigma 1.7x.

Lens types explained



Fixed focal length (PRIME)

Fixed lenses offer wider maximum apertures and superior image quality. A 50mm lens is perfect for low light, 85-105mm is ideal for portraits, while a 300mm+ tele is for sports shooters.



Telephoto zoom

Telephotos are great for sport and wildlife, while short teles are good for portraits. Telephoto lenses magnify camera shake, so look for one with Image Stabilisation to ensure you achieve the sharpest shots possible.



Standard zoom

Most DSLRs come with a standard zoom which spans from moderate wideangle to short telephoto. These 'kit' lenses are fine for most purposes, but there are alternatives that offer superior image quality.



Superzooms

While they rarely compare with shorter lenses in image quality, a superzoom offers convenience. Great for travelling when you're conscious of weight, don't expect pin-sharp, aberration-free images.



Wideangle zoom

Wideangle lenses make subjects seem further away, enabling you to get more into the shot – perfect for landscapes and architecture. The most popular wideangle zooms are the 10-20mm and 12-24mm ranges.



Macro lenses

A true macro lens lets you reproduce your subject at life-size (1:1) or half life-size (1:2) on the sensor. Macro lenses come in various focal lengths and extension tubes can offer a greater magnification.

LENS SUFFIX GUIDE USED BY MANUFACTURERS

AD	Tamron Anomalous Dispersion elements	DG	Sigma's designation for all lenses	FE	Tokina floating element lenses	N	Nikon's Nano Crystal Coating
AF-DC	Nikon defocus feature	DI	Tamron lenses for full-frame sensors	G	Nikon lenses without an aperture ring	OS	Sigma's Optically Stabilised lenses
AF-S	Nikon lenses with Silent Wave Motor	DI-II	Tamron lenses designed for APS-C	HF	Sigma Helical Focusing	PRO	Tokina's Professional range of lenses
APO	Sigma Apochromatic lenses	DO	Canon diffractive optical element lenses	HID	Tamron's High Index Dispersion glass	RF	Sigma & Nikon Rear Focusing
ASL	Tamron lenses featuring aspherical elements	DT	Sony lenses for APS-C sized sensors	HLD	Tokina low dispersion glass	SD	Tokina's Super Low Dispersion element
ASP	Sigma lenses featuring aspherical elements	DX	Nikon's designation for digital lenses	HSM	Sigma's Hypersonic Motor	SDM	Pentax's Sonic Direct Drive Motor
AT-X	Tokina's Advanced Technology Extra Pro	ED	Low Dispersion elements	IF	Internal Focusing	SF	Canon lenses with Softfocus feature
CRC	Tokina's Close Range Correction system	EF	Canon's full-frame lenses	IRF	Tokina's Internal Rear Focusing lenses	SHM	Tamron's Super Hybrid Mount
D	Nikon lenses that communicate distance info	EF-S	Canon lenses for APS-C sized sensors	IS	Canon's Image Stabilised lenses	SIC	Nikon's Super Integrated Coating
DA	Perfex lenses optimised for APS-C sized sensors	EX	Sigma's 'Excellent' range	L	Canon's 'Luxury' range of lenses	SLD	Sigma Super Low Dispersion elements
DC	Sigma's designation for digital lenses	FC	Tokina's Focus Clutch Mechanism	LD	Tamron Low Dispersion glass	SP	Tamron's Super Performance range
DF	Sigma lenses with dual focus facility	FE	Canon's fisheye lenses	M-OIS	Mega Optical Image Stabilisation	SSM	Sony/Minolta Supersonic Motor lenses

SWD	Olympus Supersonic Wave Drive
SWM	Nikon lenses with a Silent Wave Motor
TS-E	Canon Tilt and Shift lens
UD	Canon Ultra Low Dispersion glass
USM	Canon lenses with an Ultrasonic Motor
VC	Tamron's Vibration Compensation
VR	Nikon's Vibration Reduction feature
XR	Tamron Extra Refractive Index glass
ZL	Tamron's Zoom Lock feature

CANON

LENS	RRP	TESTED	SCORE	SUMMARY	MOUNT	DIMENSIONS								
						Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)
EF 8-15mm f/4 L USM	£1499	NYT		Impressive-looking fisheye zoom lens from Canon		•	•	•		15	n/a	78.5	83	540g
EF-S 10-18mm f/4.5-5.6 IS STM	£299	11/14	4★	A superb ultra wideangle that's a must-have for anyone shooting landscapes and cityscapes		•	•	•		22	67	74.6	72	240g
EF-S 10-22mm f/3.5-4.5 USM	£990	9/09	4★	A good performer, with solid MTF curves and minimal chromatic aberration		•	•	•		24	77	83.5	89.8	385g
EF 11-24mm f/4L USM	£2799	NYT		Long-awaited by Canon full-frame users, this is the world's widest-angle rectilinear zoom lens		•	•	•		28	n/a	108	132	1180g
EF 14mm f/2.8 L II USM	£2810	7/10	4.5★	Impressive resolution at f/8 but less so wide open		•	•	•		20	n/a	80	94	645g
EF-S 15-85mm f/3.5-5.6 IS USM	£900	3/11	4★	4-stop image stabilisation and Super Spectra coatings, together with a useful range		•	•	•		35	72	81.6	87.5	575g
EF 16-35mm f/2.8 L II USM	£1790	6/10	4.5★	Mark II of above lens, and a good performer with strong results at f/8 in particular		•	•	•		28	82	88.5	111.6	635g
EF 16-35mm f/4L IS USM	£1199	9/14	4★	Versatile and with a useful IS system, this is a very good ultra-wideangle zoom for full frame cameras		•	•	•		28	77	82.6	112.8	615g
TS-E 17mm f/4 L	£2920	NYT		Tilt and shift optic with independent tilt and shift rotation and redesigned coatings		•	•	•		25	77	88.9	106.9	820g
EF 17-40mm f/4 L USM	£940	11/08	4★	Designed to match the needs of demanding professionals – and does so with ease		•	•	•		28	77	83.5	96.8	500g
EF-S 17-55mm f/2.8 IS USM	£795	2/13	4★	Very capable lens with three-stop image stabilisation, Super Spectra coating and a circular aperture		•	•	•		35	77	83.5	110.6	645g
EF-S 17-85mm f/4.5-6.3 IS USM	£600	11/08	3★	Doesn't really live up to its promises. The zoom range is excellent but there are better alternatives		•	•	•		35	67	78.5	92	475g
EF-S 18-55mm f/3.5-5.6 IS II	£220	11/08	3.5★	Given the low price of this zoom, its results are very impressive		•	•	•		25	58	68.5	70	200g
EF-S 18-135mm f/3.5-5.6 IS	£500	NYT		4-stop image stabilisation and automatic panning and tripod detection		•	•	•		45	67	75.4	101	455g
EF-S 18-200mm f/3.5-5.6 IS	£740	10/11	4★	Automatic panning detection (for image stabilisation) and a useful Ttx zoom range		•	•	•		45	72	78.6	102	595g
EF 20mm f/2.8 USM	£610	NYT		Wideangle lens with a floating rear focusing system and a USM motor		•	•	•		25	72	77.5	70.6	405g
EF 24mm f/1.4 L II USM	£2010	NYT		Subwavelength structure coating, together with UD and aspherical elements		•	•	•		25	77	93.5	86.9	650g
EF 24mm f/2.8 IS USM	£750	05/13	4★	Small wideangle optic with image stabilisation		•	•	•		25	58	67.5	48.5	270g
TS-E 24mm f/3.5 L II	£2550	NYT		Tilt and shift optic with independent tilt and shift rotation and redesigned coatings		•	•	•		21	82	88.5	106.9	780g
EF 24-70mm f/2.8 L USM	£1540	7/09	4.5★	A solid performer with an excellent reputation that only years in the field can secure		•	•	•		38	77	83.2	123.5	950g
EF 24-70mm f/2.8 L II USM	£2300	XMAS 12	5★	Professional quality standard zoom lens with a fast aperture		•	•	•		38	82	88.5	113	805g
EF 24-70mm f/4 L IS USM	£1499	NYT		L-series zoom said to be compact, portable and aimed at both professionals and amateurs		•	•	•		38	77	83.4	93	600g
EF 24-105mm f/4 L IS USM	£1049	3/13	4.5★	An excellent all-round performer, and keenly priced too		•	•	•		45	77	83.5	107	670g
EF 24-105mm f/3.5-5.6 IS STM	£479	NYT		A versatile standard zoom lens that's an ideal route into full frame photography		•	•	•		40	77	83.4	104	525g
EF 28mm f/1.8 USM	£570	NYT		USM motor and an aspherical element, together with a wide maximum aperture		•	•	•		25	58	73.6	55.6	310g
EF 28mm f/2.8 IS USM	£730	05/13	3.5★	Lightweight and inexpensive lens, with a single aspherical element		•	•	•		30	52	67.4	42.5	185g
EF 28-135mm f/3.5-5.6 IS USM	£560	12/09	4.5★	Excellent optical performance, with the benefit of image stabilisation		•	•	•		50	72	78.4	96.8	540g
EF 28-300mm f/3.5-5.6 L IS USM	£3290	NYT		L-series optic with expansive range, image stabilisation and a circular aperture		•	•	•		70	77	92	184	1670g
EF 35mm f/2	£320	3/12	4.5★	A cut-price fixed focal length lens		•	•	•		25	52	67.4	42.5	210g
EF 35mm f/2 IS USM	£799	NYT		First 35mm prime from Canon to feature an optical stabilisation system		•	•	•		24	67	62.6	77.9	335g
EF 35mm f/1.4 L USM	£1720	NYT		L-series construction and a wide maximum aperture, with a ring-type USM		•	•	•		30	72	79	86	580g
EF 40mm f/2.8 STM	£230	NYT		A portable and versatile compact pancake lens. A fast maximum aperture enables low-light shooting		•	•	•		30	52	68.2	22.8	130g
EF 50mm f/1.2 L USM	£1910	NYT		Very wide maximum aperture and Super Spectra coatings, and a circular aperture		•	•	•		45	72	85.8	65.5	580g
EF 50mm f/1.4 USM	£450	2/10	5★	Brilliant performer, with a highly consistent set of MTF curves. AF motor is a tad noisy though		•	•	•		45	58	73.8	50.5	290g
EF 50mm f/1.8	£130	NYT		Lightest EF lens in the range, with wide maximum aperture and a Micro Motor		•	•	•		45	52	68.2	41	130g
EF 50mm f/2.5 Macro	£350	NYT		Compact macro lens with floating system		•	•	•		23	52	67.6	63	280g
EF-S 55-250mm f/4-5.6 IS II	£330	1/12	4★	Ideal budget addition to the 18-55mm kit lens, with image stabilisation and USM		•	•	•		110	58	70	108	390g
EF-S 60mm f/2.8 Macro USM	£540	8/06	4★	Great build and optical quality, with fast, accurate and near-silent focusing		•	•	•		20	52	73	69.8	335g
MP-E65 f/2.8 1-5x Macro	£1250	NYT		Macro lens designed to achieve a magnification greater than 1x without accessories		•	•	•		24	58	81	98	710g
EF 70-200mm f/2.8 L USM	£1540	NYT		Non-stabilised L-series optic, with rear focusing and four UD elements		•	•	•		150	77	84.6	193.6	1310g
EF 70-200mm f/4 L IS USM	£1450	11/11	5★	A superb option for the serious sports and action photographer		•	•	•		120	67	76	172	760g
EF 70-200mm f/2.8 L IS II USM	£2800	10/10	5★	A great lens but also a costly one. Peak resolution at 0.4 cycles-per-pixel is simply amazing		•	•	•		120	77	88.8	199	1490g
EF 70-200mm f/4 L USM	£790	NYT		A cheaper L-series alternative to the f/2.8 versions available		•	•	•		120	67	76	172	705g
EF 70-300mm f/4.5-5.6 IS USM	£470	11/10	4★	A great level of sharpness and only the small apertures should be avoided		•	•	•		150	58	76	143	630g
EF 70-300mm f/4.5-5.6 L IS USM	£1600	7/11	5★	An L series lens with a highly durable outer shell		•	•	•		120	67	89	143	1050g
EF 70-300mm f/4.5-5.6 DO IS USM	£1700	NYT		3-layer diffractive optical element and image stabilisation		•	•	•		140	58	82.4	99.9	720g
EF 75-300mm f/4.5-6.3 III	£300	NYT		Essentially the same lens as the 75-300mm f/4.0-5.6 III USM but with no USM		•	•	•		150	58	71	122	480g
EF 75-300mm f/4.5-6.3 III USM	£350	9/07	2.5★	Good but not outstanding. The inclusion of a metal lens mount is positive, though		•	•	•		150	58	71	122	480g
EF 85mm f/1.2 L II USM	£2640	8/06	4★	A well-crafted lens, with fast and quiet AF with good vignetting and distortion control		•	•	•		95	72	91.5	84.0	1025g
EF 85mm f/1.8 USM	£470	2/11	5★	Non-rotating front ring thanks to rear focusing system, as well as USM		•	•	•		85	58	75	71.5	425g
TS-E 90mm f/2.8	£1670	NYT		Said to be the world's first 35mm-format telephoto lens with tilt and shift movements		•	•	•		50	58	73.6	88	565g
EF 100mm f/2 USM	£559	NYT		A medium telephoto lens with a wide aperture, making it ideal for portraits		•	•	•		90	58	75	73.5	460g
EF 100mm f/2.8 Macro USM	£650	11/09	4★	A solid performer, but weak at f/2.8 (which is potentially good for portraits)		•	•	•		31	58	79	119	600g
EF 100mm f/2.8 L Macro IS USM	£1060	1/13	5★	Stunning MTF figures from this pro-grade macro optic		•	•	•		30	67	77.7	123	625g
EF 100-400mm f/4.5-5.6 L IS USM	£1940	NYT		L-series construction and optics, including fluorite and Super UD elements		•	•	•		180	77	92	189	1380g
EF 135mm f/2 L USM	£1360	NYT		L-series construction with two UD elements and wide maximum aperture		•	•	•		90	72	82.5	112	750g
EF 135mm f/2.8 SF	£520	NYT		Soft-focus feature with two degrees of softness		•	•	•		130	52	69.2	98.4	390g
EF 180mm f/3.5 L Macro USM	£1870	NYT		L-series macro lens with inner focusing system and USM technology		•	•	•		48	72	82.5	186.6	1090g
EF 200mm f/2 L IS USM	£7350	NYT		5-stop Image Stabilisation with tripod detection and Super Spectra lens coatings		•	•	•		190	52	128	208	2520g
EF 200mm f/2.8 L II USM	£960	NYT		Two UD elements and a rear-focusing system in this L-series optic		•	•	•		150	72	83.2	136.2	765g
EF 300mm f/2.8 L IS II USM	£7500	NYT		4 stop Image stabilisation makes this lens perfect for action photography		•	•	•		200	52	128	248	2400g
EF 300mm f/4 L IS USM	£1740	NYT		Two-stop image stabilisation with separate mode for panning moving subjects		•	•	•		150	77	90	221	1190g
EF 400mm f/2.8 L IS USM	£9810	NYT		Super telephoto with ring-type USM, one fluorite element and image stabilisation		•	•	•		300	52	163	349	5370g
EF 400mm f/4 DO IS USM	£8000	NYT		Multi-layer diffractive optical element to correct for chromatic aberration		•	•	•		350	52	128	232.7	1940g
EF 400mm f/5.6 L USM	£1660	NYT		Super UD and UD elements, as well as a detachable tripod mount and built-in hood		•	•	•		350	77	90	256.5	1250g
EF 500mm f/4 L IS USM II	£5299	NYT		Full-time manual focus, a single fluorite element and dust and moisture protection		•	•	•		450	52	146	387	3870g

NIKON

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
10.5mm f/2.8 G ED DX Fisheye	£678	NYT		DX format fisheye lens with Nikon's Close-Range Correction system and ED glass					•			14	n/a	63	62.5	300g	
10-24mm f/3.5-4.5 G ED AF-S	£834	10/09	4★	MTF performance is good from wide open to f/11, only breaking down past f/22					•			24	77	82.5	87	460g	
12-24mm f/4 G ED AF-S DX	£1044	9/09	4★	This venerable optic may be a little weak at f/4, but otherwise it's a good performer					•			30	77	82.5	90	485g	
14mm f/2.8 D ED AF	£1554	7/10	5★	A really nice lens that handles well and offers excellent image quality					•			20	n/a	87	86.5	670g	
14-24mm f/2.8 G ED AF-S	£1670	2/08	5★	A remarkable piece of kit, producing sharp images with little chromatic aberration					•			28	n/a	98	131.5	970g	
16mm f/2.8 D AF Fisheye	£762	NYT		Full-frame fisheye lens with Close-Range Correction system and 25cm focus distance					•			25	n/a	63	57	290g	
16-35mm f/4 G ED AF-S VR	£1072	6/10	5★	A fantastic lens that deserves to be taken seriously, with very little CA throughout					•			28	77	82.5	125	685g	
16-85mm f/3.5-5.6 G ED VR AF-S DX	£574	3/11	4★	Boasting Nikon's second-generation VR II technology and Super Integrated Coating					•			38	67	72	85	485g	
17-35mm f/2.8 D ED-IF AF-S	£1878	NYT		High-quality wideangle zoom for full-frame Nikon users					•			28	77	82.5	106	745g	
17-55mm f/2.8 G ED-IF AF-S DX	£1356	3/07	4★	A higher quality standard zoom for DX-format DSLRs					•			36	77	85.5	110.5	755g	
18-35mm f/3.5-4.5 G ED AF-S	£669	Xmas13	5★	Wideangle zoom with instant manual-focus override for full-frame DSLRs					•			28	77	83	95	385g	
18-55mm f/3.5-5.6 G II AF-S DX	£156	12/08	3.5★	Entry-level standard zoom lens					•			28	52	73	79.5	265g	
18-55mm f/3.5-5.6 G VR AF-S DX	£188	5/08	4★	An improvement over the above version, with excellent resolution the benefit of VR					•			28	52	70.5	74	205g	
18-55mm f/3.5-5.6 G VR II AF-S DX	£229	NYT		Popular 3x zoom lens that is remarkably compact and lightweight, offering great portability					•			28	52	66	59.5	195g	
18-105mm f/3.5-5.6 G ED VR AF-S DX	£292	8/12	4.5★	Kit lens for Nikon D90 & D7000 with Silent Wave Motor and Vibration Reduction					•			n/a	67	76	89	420g	
18-200mm f/3.5-5.6 G IF-ED AF-S	£762	10/11	4.5★	4-stop VR II system, two ED and three aspherical elements in this DX superzoom lens					•			50	72	77	96.5	560g	
18-300mm f/3.5-5.6 G ED-IF VR	£850	12/12	4★	DX-format zoom lens with wideangle to super-telephoto reach					•			45	77	83	120	830g	
18-300mm f/3.5-6.3 G ED VR	£849	NYT		New DX-format 16.7x zoom with super-telephoto reach – a compact 'walkabout' lens					•			48	67	78.5	99	550g	
20mm f/2.8 D AF	£584	NYT		Compact wideangle lens with Nikon's Close-Range Correction system					•			25	62	69	42.5	270g	
24mm f/2.8 D AF	£427	NYT		Compact wide lens with Close-Range Correction system					•			30	52	64.5	46	270g	
24mm f/1.4 G ED AF-S	£1990	8/10	5★	Nothing short of stunning. Aside from its high price there is very little to dislike about this optic					•			25	77	83	88.5	620g	
24mm PC-E f/3.5 D ED PC-E	£1774	NYT		Perspective Control lens with Nano Crystal Coating and electronic control over aperture					•			21	77	82.5	108	730g	
24-70mm f/2.8 G ED AF-S	£1565	7/09	5★	An excellent set of MTF curves that show outstanding consistency, easily justifying the price of this lens					•			38	77	83	133	900g	
24-85mm f/3.5-4.5 G ED VR	£520	XMAS12	5★	FX-format standard zoom with Auto Tripod detection and VR					•			38	72	78	82	465g	
24-120mm f/4 G ED AF-S VR	£1072	5/11	5★	Constant maximum aperture of f/4 and the addition of VR makes this a superb lens					•			45	77	84	103	710g	
28mm f/1.8 G ED AF-S	£619	4/13	5★	If you crave a wide aperture and prefer a single focal length then this Nikon prime delivers					•			25	67	73	80	330g	
28mm f/2.8 D AF	£282	NYT		Compact wideangle lens with a minimum focusing distance of 25cm					•			25	52	65	44.5	205g	
28-300mm f/3.5-5.6 G ED AF-S VR	£889	1/13	4.5★	Technical testing shows this zoom to be, as Nikon claims, the 'ideal walkabout lens'					•			50	77	83	114	800g	
35mm f/1.8 G AF-S DX	£208	3/12	5★	Designed for DX-format DSLRs, a great standard prime lens					•			30	52	70	52.5	200g	
35mm f/1.8 G ED AF-S	£TBC	NYT		Fast FX-format prime lens with bright f/1.8 aperture. Versatile and lightweight					•			25	58	72	71.5	305g	
35mm f/2 D AF	£324	9/08	3★	At wide-aperture settings this optic achieves respectable resolution, which decreases with aperture					•			25	52	64.5	43.5	205g	
35mm f/1.4 G ED AF-S	£1735	9/12	5★	A Nano Crystal-coated lens designed for the FX range					•			30	67	83	89.5	600g	
40mm f/2.8 G AF-S DX Micro	£250	12/11	5★	A budget-priced macro lens that delivers the goods on multiple fronts					•			20	52	68.5	64.5	235g	
45mm PC-E f/2.8 D ED PC-E	£1774	NYT		Perspective Control lens with ED glass and Nano Crystal Coating					•			25	77	83.5	112	780g	
50mm f/1.2	£855	NYT		Ultra-fast f/1.2 aperture prime lens					•			50	52	68.5	47.5	360g	
50mm f/1.4 D AF	£292	2/10	5★	Entry-level prime puts in a fine performance while offering backwards compatibility with AI cameras					•			45	52	64.5	42.5	230g	
50mm f/1.4 G AF-S	£376	2/10	5★	Internal focusing and superior AF drive makes this a good alternative to the D-series 50mm f/1.4					•			45	58	73.5	54	280g	
50mm f/1.8 D AF	£135	NYT		Compact, lightweight, affordable prime, will stop down to f/22					•			45	52	63	39	160g	
50mm f/1.8 G AF-S	£200	9/11	5★	A cut-price standard lens for FX shooters or a short telephoto on DX-format DSLRs					•			45	58	72	52.5	185g	
55mm f/2.8 Micro	£625	NYT		Macro lens with 1/2 maximum reproduction ratio					•			25	52	63.5	62	290g	
55-200mm f/4-5.6 G VR AF-S DX	£314	8/07	3.5★	Designed for DX-format cameras, with Vibration Reduction and SWM technology					•			110	52	73	99.5	335g	
55-300mm f/4.5-5.6 G VR AF-S DX	£378	1/12	3★	Offers a wide telephoto coverage, but better options available					•			140	58	76.5	123	530g	
58mm f/1.4 G AF-S	£1599	2/14	4★	FX-format full frame premium prime lens with large f/1.4 aperture					•			58	72	85	70	385g	
60mm f/2.8 D AF Micro	£405	8/06	5★	Nikon's most compact Micro lens, with Close Range Correction (CRC) system					•			22	62	70	74.5	440g	
60mm f/2.8 G ED AF-S Micro	£500	NYT		Micro lens with 1:1 repro ratio, as well as a Silent Wave Motor and Super ED glass					•			18	62	73	89	425g	
70-200mm f/2.8 G ED VR II AF-S	£2085	10/10	5★	Very little to fault here, with stunning image quality and consistent results at different focal lengths					•			140	77	87	209	1540g	
70-200mm f/4 G ED VR	£1180	7/13	5★	Latest 70-200mm offers third-generation VR and weight savings over its more expensive f/2.8 cousin					•			1000	67	78	178.5	850g	
70-300mm f/4.5-5.6 G ED AF-S VR	£556	11/10	4★	Feature-packed optic, with a VR II system, 9-bladed diaphragm, SWM and ED glass					•			n/a	67	80	143.5	745g	
80-400mm f/4.5-5.6 G ED VR AF	£1512	NYT		3-stop Vibration Reduction with panning detection and a nine-bladed diaphragm					•			230	77	91	171	1340g	
85mm f/3.5 G ED AF-S DX VR	£522	NYT		DX-format Micro lens with a 1:1 reproduction ratio, VR II system and ED glass					•			28	52	73	98.5	355g	
85mm f/1.4 G AF-S	£1532	2/11	5★	Fast mid-tele lens with an internal focusing system and rounded diaphragm					•			85	77	86.5	84	595g	
85mm f/1.8D	£385	NYT		Portable medium telephoto – ideal for portraits					•			85	62	71.5	58.5	380g	
85mm f/1.8 G AF-S	£470	5/12	5★	Rear-focusing system and distance window in this medium telephoto lens					•			80	67	80	73	350g	
105mm f/2.8 G AF-S VR II Micro	£782	11/09	4.5★	A very sharp lens, with swift and quiet focusing and consistent MFT results					•			31	62	83	116	720g	
105mm f/2 D AF DC	£980	NYT		A portrait lens with defocus control					•			90	n/a	79	111	640g	
135mm f/2 D AF DC	£1232	NYT		Defocus-Image Control and a rounded diaphragm in this telephoto optic					•			110	n/a	79	120	815g	
180mm f/2.8 D ED-IF AF	£782	NYT		Useful telephoto length and internal focusing technology, together with ED glass					•			150	72	78.5	144	760g	
200mm f/4 D ED-IF AF Micro	£1429	NYT		1:1 reproduction range in this Micro lens, with a Close-Range Correction system					•			50	62	76	104.5	1190g	
200mm f/2 G ED AF-S VR II	£5412	NYT		A full frame lens offering ghost-reducing Nano Crystal coating					•			190	52	124	203	2930g	
300mm f/4 ED-IF AF-S	£1230	NYT		Light, compact AF-S telephoto lens with ED glass elements					•			145	77	90	222.5	1440g	
300mm f/2.8 G ED AF-S VR II	£5209	NYT		This lens promises fast and quiet AF, and is fitted with Nikon's latest VR II system					•			230	52	124	267.5	2900g	

OLYMPUS

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focal (mm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
7-14mm f/4 ED	£1900	6/08	5★	An excellently constructed objective, with image quality to match		•						25	n/a	86.5	119.5	780g	
8mm f/3.5 ED Fisheye	£930	NYT		Diagonal fisheye lens, offering a 180° view and a splash-resistant construction		•						13	n/a	79	77	485g	
9-18mm f/4-5.6	£640	9/09	4★	Good results up to f/11, past which point resolution drops a little		•						25	72	79.5	73	280g	
12-50mm f/3.5-6.3 ED	£370	5/13	4★	Offers electromagnetic zoom mechanism plus variable zoom speed		•						20	72	57	83	211g	
12-60mm f/2.8-4 ED SWD	£1130	11/08	4.5★	While not quite as consistent as the 14-54mm, this optic is perhaps more versatile		•						25	72	79.5	98.5	575g	
11-22mm f/2.8-3.5	£1020	NYT		Wide angle (2x) addition to Olympus E-System lens range		•						28	72	75	92.5	485g	
14-35mm f/2 ED SWD	£2400	NYT		Pro lens with Supersonic Wave Drive AF system and dust and splashproof casing		•						35	77	86	123	915g	
14-42mm f/3.5-5.6 ED	£285	NYT		Small, light lens especially designed for the compact Four Thirds system standard		•						25	58	65	61	190g	
14-54mm II f/2.8-3.5 II	£660	12/09	4★	An affordable lens with great resolution – only CA control lets it down a touch		•						22	67	74.5	88.5	440g	
18-180mm f/3.5-6.3	£560	6/10	4★	A good performer everywhere except at 180mm, with a solid feel to it		•						45	62	78	84.5	435g	
25mm f/2.8 Pancake	£270	9/08	3.5★	Excellent image quality from such a tiny optic, but the lens cap is a little fiddly		•						20	43	64	23.5	95g	
35mm f/3.5 Macro	£270	NYT		Macro lens equivalent to 70mm on a full frame camera		•						14	52	71	53	163g	
35-100mm f/2	£2630	NYT		One Super ED and four ED elements inside this telephoto optic		•						140	77	96.5	213.5	1650g	
40-150mm f/4-5.6 ED	£300	NYT		ED and aspherical elements in this optic, together with an internal focusing system		•						90	58	65.5	72	220g	
50mm f/2 ED Macro	£600	8/06	3.5★	A fast, high-quality lens, with excellent MTF curves and low chromatic aberration		•						24	52	71	61.5	300g	
50-200mm f/2.8-3.5 ED SWD	£1300	NYT		Supersonic Wave Drive focusing system and an equivalent focal range of 100-400mm		•						120	67	86.5	157	995g	
70-300mm f/4-5.6 ED	£450	NYT		Three ED elements and multi-coatings feature in this popular tele-zoom optic		•						96	58	80	127	620g	
90-250mm f/2.8 ED	£6200	NYT		Dust and splashproof lens with 3 ED elements and a 180-500mm equivalent range		•						250	105	124	276	3270g	
150mm f/2 ED	£2650	NYT		Splashproof telephoto lens with a wide maximum aperture		•						140	82	100	150	1610g	
300mm f/2.8 ED	£7800	NYT		Splashproof telephoto lens with three ED elements and an inner focusing system		•						240	43	129	281	3290g	

PENTAX

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focal (mm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
DA 10-17mm f/3.5-4.5 smc ED IF	£590	NYT		Fisheye zoom lens with Super Protection coating and Quick Shift manual focus		•						14	n/a	71.5	68	320g	
DA 12-24mm f/4 smc ED AL IF	£1050	NYT		Two aspherical elements, ELD glass and a constant aperture of f/4 in this wide zoom		•						30	77	83.5	87.5	430g	
DA 14mm f/2.8 smc ED IF	£730	7/10	4.5★	Best performance lies between f/5.6 and f/11, but good results can be had at f/4 too		•						17	77	83.5	69	420g	
DA 15mm f/4 smc ED AL Limited	£820	NYT		Limited edition lens with hybrid aspherical and extra-low dispersion elements		•						18	49	39.5	63	212g	
DA* 16-50mm f/2.8 smc ED AL IF SDM	£950	1/09	3.5★	A nice balance and robust feel, but poor sharpness at f/2.8 (which significantly improves from f/4 onwards)		•						30	77	98.5	84	600g	
DA 17-70mm f/4 smc AL IF SDM	£630	NYT		Featuring Pentax's Supersonic Direct-drive (SDM) focusing system		•						28	67	75	93.5	485g	
DA 18-55mm f/3.5-5.6 smc II ED AL IF	£220	1/09	3.5★	Something of a bargain. Only the maximum apertures and awkward manual focusing really let it down		•						25	52	68	67.5	220g	
DA 18-55mm f/3.5-5.6 smc AL WR	£229	NYT		A weather resistant construction and an aspherical element, as well as SP coating		•						25	52	68.5	67.5	230g	
DA 18-135mm f/3.5-5.6 DA ED DC WR	£600	6/11	3.5★	A weather resistant mid-range zoom lens		•						40	62	73	76	405g	
DA 18-270mm f/3.5-6.3 smc EDSDM	£699	NYT		15x superzoom for company's K-mount DSLRs featuring two extra-low dispersion (ED) elements		•						49	62	76	89	453g	
DA 20-40mm f/2.8-4 ED Limited DC WR	£829	NYT		With state-of-the-art HD coating, a completely round-shaped diaphragm, and weather-resistant		•						28	55	68.5	71	283g	
DA 21mm f/3.2 smc AL Limited	£600	NYT		This limited-edition optic offers a floating element for extra-close focusing		•						20	49	63	25	140g	
FA 31mm f/1.8 smc AL Limited	£1149	NYT		Aluminium body; when used on a Pentax DSLR offers a perspective similar to that of the human eye		•						30	58	68.5	65	345g	
DA 35mm f/2.8 smc Macro	£640	9/08	4.5★	Despite slight edge softness, this lens performs excellently and is a pleasure to use		•						14	49	46.5	63	215g	
DA 35mm f/2.4 smc DS AL	£180	3/12	5★	A budget price prime lens for beginners		•						30	49	63	45	124g	
DA 40mm f/2.8 smc Limited	£450	NYT		Pancake lens with SMC coating and Quick Shift focusing system		•						40	49	63	15	90g	
DA 40mm XS f/2.8 XS	£325	NYT		The world's smallest fixed focal length lens		•						40	N/A	62.9	9	52g	
FA 43mm f/1.9 smc Limited	£729	NYT		Focal length is ideal for portraits as well as everyday use, and features an smc multi-layer coating		•						45	49	27	64	155g	
FA 50mm f/1.4 smc	£399	NYT		High quality fast prime. The 'FA' indicates that its image circle covers the 35mm full-frame format		•						45	49	63.5	38	220g	
DA 50mm f/1.8 smc DA	£249	NYT		Affordable short telephoto lens ideal for portraits		•						45	52	28.5	63	122g	
DFA 50mm f/2.8 smc Macro	£550	NYT		Macro lens capable of 1:1 reproduction and with a Quick Shift focus mechanism		•						19	49	60	67.5	265g	
DA* 50-135mm f/2.8 smc ED IF SDM	£1200	11/12	4★	Constant f/2.8 aperture; well suited to portraiture and mid-range action subjects		•						100	67	76.5	136	765g	
DA 50-200mm f/4-5.6 smc ED WR	£210	NYT		Weather-resistant construction, Quick Shift focus system and an SP coating		•						n/a	49	69	79.5	285g	
DA* 55mm f/1.4 smc SDM	£800	2/10	4.5★	Even despite questions about the particular sample tested, this lens scores highly		•						45	58	70.5	66	375g	
DA 55-300mm f/4-5.8 smc ED	£370	10/12	4★	The lens boasts a useful focal range, as well as a dirt-resistant SP coating		•						140	58	75	111.5	440g	
DA 55-300mm f/4-5.8 ED WR	£399	NYT		Weatherproof HD telephoto lens featuring quick shift focusing system		•						140	58	71	111.5	466g	
DA 60-250mm f/4 smc ED IF SDM	£1450	10/12	4.5★	With a constant f/4 aperture and an ultrasonic motor for speedy focusing		•						110	67	167.5	82	1040g	
DA 70mm f/2.4 smc AL Limited	£600	NYT		Medium telephoto lens with an aluminium construction and a Super Protect coating		•						70	49	63	26	130g	
D-FA* 70-200mm f/2.8 ED DC AW	£1850	NYT		New addition to Pentax's high-performance Star (*) series developed for best image rendition		•						120	77	91.5	203	1755g	
FA 77mm f/1.8 smc Limited	£1050	NYT		With Pentax's Fixed Rear Element Extension focusing system for 'sharp, crisp images'		•						70	49	48	64	270g	
D-FA 100mm f/2.8 Macro	£700	NYT		Designed for both digital and film cameras, this macro lens boasts a 1:1 repro ratio		•						30	49	67.5	80.5	345g	
D-FA 100mm f/2.8 Macro WR	£680	11/12	5★	Street price makes this something of a bargain for a true macro offering full-frame coverage		•						30	49	65	80.5	340g	
FA 150-450mm f/4.5-5.6 ED DC AW	£2000	NYT		Super-telephoto lens with weather-resistance, designed to produce extra-sharp, high-contrast images		•						200	86	241.5	95	2000g	
DA* 200mm f/2.8 smc ED IF SDM	£1000	8/12	4.5★	SDM focusing system on the inside, and dirtproof and splashproof on the outside		•						120	77	83	134	825g	
DA* 300mm f/4 smc ED IF SDM	£1300	NYT		This tele optic promises ultrasonic focus and high image quality thanks to ED glass		•						140	77	83	184	1070g	
DA 560mm f/5.6 ED smc AW	£5999	NYT		Prime offering focal length of 859mm when mounted on Pentax K-mount DSLR. Treated with HD coating		•						560	112	130	522	3040g	

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SAMYANG

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
8mm f/3.5 UMC Fisheye CS II	£274	NYT		Wideangle fisheye lens designed for digital reflex cameras with APS-C sensors		•	•	•	•	•		30	N/A	75.	77.8	417g	
10mm f/2.8 ED AS NCS CS	£429	NYT		Features a nano crystal anti-reflection coating system and embedded lens hood		•	•	•	•	•	•	24	N/A	86	77	580g	
14mm f/2.8 ED UMC	£279	NYT		Ultra wideangle manual focus lens; bulb-like front element means no filters can be used		•	•	•	•	•	•	28	N/A	94	87	552g	
16mm f/2.0 ED AS UMC CS	£389	NYT		Ultra wideangle lens for digital reflex cameras and mirrorless compact cameras fitted with APS-C sensors		•	•	•	•	•	•	20	N/A	89.4	83	583g	
24mm f/1.4 AS UMC	£499	NYT		Fast ultra wideangle manual focus lens comprising 13 lenses arranged in 12 groups		•	•	•	•	•	•	25	77	95	116	680g	
24mm f/3.5 AS T-S ED AS UMC	£789	NYT		Wideangle tilt-shift prime featuring 16 glass elements and f/3.5 maximum aperture		•	•	•	•	•	•	20	82	110.5	113	680g	
35mm f/1.4 AS UMC	£369	3/13	4.5★	While manual focus only, this prime impressed us in real-world use, making it something of a bargain		•	•	•	•	•	•	30	77	83	111	660g	
35mm T1.5 AS UMC VDSLR	£419	NYT		VDSLR version of 35mm f/1.4 AS UMC with de-clicked aperture ring for silent operation when used for video		•	•	•	•	•	•	30	77	83	111	660g	
85mm f/1.4 IFMC	£239	NYT		Short fast telephoto prime, manual focus, aimed at portrait photographers		•	•	•	•	•	•	100	72	78	72.2	513	

SIGMA

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
4.5mm f/2.8 EX DC	£739	NYT		Circular fisheye lens designed for digital, with SLD glass and a gelatin filter holder		•	•	•	•	•	•	13	n/a	76	77.8	470g	
8mm f/3.5 EX DG	£799	NYT		The world's only 8mm lens equipped with autofocus also boasts SLD glass		•	•	•	•	•	•	13	n/a	73.5	68.6	400g	
8-16mm f/4.5-5.6 DC HSM	£800	10/10	4★	Excellent performance at 8mm which sadly drops at the 16mm end		•	•	•	•	•	•	24	72	75	105.7	555g	
10mm f/2.8 EX DC	£599	NYT		A Hyper Sonic Motor (HSM) and built-in hood in this diagonal fisheye lens		•	•	•	•	•	•	13	n/a	75.8	83	475g	
10-20mm f/3.5 EX DC HSM	£650	3/10	5★	An absolute gem of a lens that deserves a place on every photographer's wish list		•	•	•	•	•	•	24	82	87.3	88.2	520g	
10-20mm f/4-5.6 EX DG HSM	£550	8/09	5★	A fine all-rounder, thanks to MTF curves which stay above 0.25 cycles-per-pixel down to f/16		•	•	•	•	•	•	24	77	83.5	81	470g	
12-24mm f/4.5-5.6 EX DC HSM	£868	8/09	4★	A tightly matched set of MTF curves, but APS-C users are advised to look at the 10-20mm instead		•	•	•	•	•	•	28	n/a	87	102.5	600g	
15mm f/2.8 EX DG	£629	7/10	4★	This fisheye optic puts in a very solid performance – not to be dismissed as a gimmick!		•	•	•	•	•	•	15	n/a	73.5	65	370g	
17-50mm f/2.8 EX DC OS HSM	£689	NYT		FLD and aspherical elements, a constant f/2.8 aperture and Optical Stabilisation		•	•	•	•	•	•	28	77	83.5	92	565g	
17-70mm f/2.8-4 DC Macro OS HSM	£449	NYT		Redesign of this well-received lens launches the 'Contemporary' range and sees it in more compact form		•	•	•	•	•	•	22	72	79	82	470g	
18-35mm f/1.8 DC HSM	£799	11/13	5★	Said to be the world's first constant f/1.8 zoom; DOF equivalent of constant f/2.7 on full frame		•	•	•	•	•	•	28	72	78	121	810g	
18-200mm f/3.5-6.3 DC	£349	3/08	3★	Good CA control at 200mm but otherwise an average performer		•	•	•	•	•	•	45	62	70	78.1	405g	
18-200mm f/3.5-6.3 DC OS	£449	3/08	4★	Excellent resolution and consistent performance, but control over CA could be a little better		•	•	•	•	•	•	45	45	79	100	610g	
18-250mm f/3.5-6.3 DC OS HSM	£572	1/10	4.5★	A very capable set of MTF curves that only shows minor weakness at wide apertures		•	•	•	•	•	•	45	72	79	101	630g	
18-250mm f/3.5-6.3 DC Macro OS HSM	£500	NYT		Ultra-compact 13.8x high zoom ratio lens designed exclusively for digital SLR cameras		•	•	•	•	•	•	35	62	73.5	88.6	470g	
18-300mm f/3.5-6.3 DC Macro OS HSM	£499	NYT		Compact and portable high ratio zoom lens offering enhanced features to make it the ideal all-in-one lens		•	•	•	•	•	•	39	72	79	101.5	585g	
24mm f/1.4 DG HSM A	£799	06/15	5★	The latest addition to Sigma's 'Art' line of high-quality fast primes		•	•	•	•	•	•	25	77	85	90.2	665g	
24-70mm f/2.8 EX DG IF HSM	£899	8/09	5★	Not perfect, but an excellent alternative to Canon and Nikon's 24-70mm lenses, with great MTF curves		•	•	•	•	•	•	38	82	88.6	94.7	790g	
24-105mm f/4 DG OS HSM A	£849	3/14	4.5★	Serious full frame alternative to own-brand lenses at a lower price but with no compromises in the build		•	•	•	•	•	•	45	82	89	109	885g	
30mm f/1.4 EX DC HSM	£490	9/08	3★	A consistent performer, with slightly weaker but not unacceptable performance wide-open		•	•	•	•	•	•	40	62	76.6	59	430g	
35mm f/1.4 DG HSM Art	£799	9/13	5★	Large aperture prime; first lens in company's 'Art' series		•	•	•	•	•	•	30	67	77	94	665g	
50mm f/1.4 EX DC HSM	£459	2/10	5★	This lens may be priced above the norm, but it delivers results which are similarly elevated		•	•	•	•	•	•	45	77	84.5	68.2	505g	
50mm f/1.4 DG HSM Art	£849	7/14	4★	This lens is a unique design that pays off in truly excellent image quality		•	•	•	•	•	•	40	77	85.4	100	815g	
50-500mm f/4.5-6.3 DG OS HSM	£1499	4/11	4★	A 10x zoom range, SLD elements and compatibility with 1.4x and 2x teleconverters		•	•	•	•	•	•	50-180	95	104.4	219	1970g	
70-200mm f/2.8 EX DG OS HSM	£1539	NYT		Two FLD glass elements, said to have the same dispersive properties as fluorite		•	•	•	•	•	•	140	77	86.4	197	1430g	
70-300mm f/4-5.6 APO DG Macro	£235	NYT		A 9-bladed diaphragm and two SLD elements in this tele-zoom lens		•	•	•	•	•	•	95	58	76.6	122	550g	
70-300mm f/4-5.6 DG Macro	£173	5/09	3★	Generally unremarkable MTF curves, and particularly poor at 300mm		•	•	•	•	•	•	95	58	76.6	122	545g	
85mm f/1.4 EX DG HSM	£890	2/11	5★	The Sigma's resolution from f/4 to f/8 is excellent		•	•	•	•	•	•	85	77	86.4	87.6	725g	
105mm f/2.8 EX DG OS HSM	£649	12/11	4.5★	An optically-stabilised macro lens		•	•	•	•	•	•	31.2	62	78	126.4	725g	
120-300mm f/2.8 DG HSM	£3599	NYT		First lens in company's 'Sports' series; switch enables adjustment of both focus speed and focus limiter		•	•	•	•	•	•	150-250	105	124	291	TBA	
150mm f/2.8 EX DG OS HSM	£999	NYT		A macro lens offering image stabilisation		•	•	•	•	•	•	38	72	79.6	150	950g	
150-500mm f/5-6.3 DG OS HSM	£999	6/09	3★	Significant softness at wide maximum apertures for all focal lengths		•	•	•	•	•	•	220	86	94.7	252	1780g	
150-600mm f/5-6.3 DG OS HSM S	£1599	1/15	4★	This portable, high-performance telephoto zoom from Sigma's Sports line is dust and splashproof		•	•	•	•	•	•	260	105	121	290.2	2860g	
180mm f/2.8 EX DG OS HSM	£1499	4/13	5★	1:1 macro lens featuring three FLD glass elements and floating inner focusing system		•	•	•	•	•	•	47	86	95	204	1640g	
300mm f/2.8 APO EX DG	£2899	NYT		Extra Low Dispersion (ELD) glass, multi-layer coatings and a Hyper Sonic Motor		•	•	•	•	•	•	250	46	119	214.5	2400g	
300-800mm f/5.6 EX DG HSM	£6999	NYT		A constant aperture of f/5.6 throughout the expansive 300-800mm zoom range		•	•	•	•	•	•	600	46	156.5	544	5880g	
500mm f/4.5 APO EX DG	£4799	NYT		Telephoto lens with multi-layer coatings to 'optimise the characteristics of DSLRs'		•	•	•	•	•	•	400	46	123	350	3150g	
800mm f/5.6 APO EX DG	£5499	NYT		HSM and compatibility with Sigma's 1.4x EX APO and 2x EX APO teleconverters		•	•	•	•	•	•	700	46	156.5	521	4900g	

SONY

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
11-18mm f4.5-5.6 DT	£609	9/09	3★	A solid overall performance that simply fails to be outstanding in any way	•	•	•	•	•	•	•	25	77	83	80.5	360g	
16mm f/2.8 Fisheye	£709	NYT		Fisheye lens with a close focusing distance of 20cm and a 180° angle of view	•	•	•	•	•	•	•	20	n/a	75	66.5	400g	
16-35mm f/2.8 ZA SSM T*	£1729	9/09	4.5★	High-end Zeiss wideangle zoom lens ideal for full frame Alpha DSLRs	•	•	•	•	•	•	•	28	77	83	114	900g	
16-50mm f/2.8 SSM	£569	4/12	4★	Bright short-range telephoto lens	•	•	•	•	•	•	•	100	72	81	88	577g	
16-80mm f/3.5-4.5 ZA T*	£709	4/09	4.5★	Carl Zeiss standard zoom lens	•	•	•	•	•	•	•	35	62	72	83	445g	
16-105mm f/3.5-5.6 DT	£559	3/09	3★	An ambitious lens that is good in parts. Quality drops off at 105mm	•	•	•	•	•	•	•	40	62	72	83	470g	
18-135mm f/3.5-5.6 DT SAM	£429	NYT		A versatile zoom with Direct Manual Focus	•	•	•	•	•	•	•	45	62	76	86	398g	
18-200mm f/3.5-6.3 DT	£509	4/08	3★	While the focal range is certainly useful, the lens is an overall average performer	•	•	•	•	•	•	•	45	62	73	85.5	405g	
18-250mm f/3.5-6.3 DT	£559	1/10	3.5★	Good overall, but performance dips at longer focal lengths	•	•	•	•	•	•	•	45	62	75	86	440g	
20mm f/2.8	£559	9/11	3.5★	Wideangle prime lens with rear focusing mechanism and focus range limiter	•	•	•	•	•	•	•	25	72	78	53.5	285g	
24mm f/2 ZA SSM T*	£1119	NYT		An impressively bright wideangle Carl Zeiss lens	•	•	•	•	•	•	•	19	72	78	76	555g	
24-70mm f/2.8 ZA SSM T*	£1679	7/09	5★	Carl Zeiss mid-range zoom lens with superb optics ideal for full frame Alpha DSLRs	•	•	•	•	•	•	•	34	77	83	111	955g	
28-75mm f/2.8 SAM	£709	NYT		A constant f/2.8 aperture and a Smooth Autofocus Motor (SAM) in this standard zoom	•	•	•	•	•	•	•	38	67	77.5	94	565g	
30mm f/2.8 DT SAM Macro	£179	3/12	4★	Macro lens designed for digital with 1:1 magnification and Smooth Autofocus Motor	•	•	•	•	•	•	•	12	49	70	45	150g	
35mm f/1.4 G	£1369	NYT		With an equivalent focal length of 52.5mm, a wide aperture and aspherical glass	•	•	•	•	•	•	•	30	55	69	76	510g	
35mm f/1.8 DT SAM	£179	NYT		Budget price indoor portrait lens	•	•	•	•	•	•	•	23	55	70	52	170g	
50mm f/1.8 DT SAM	£159	3/10	4.5★	A very useful lens that performs well and carries a rock-bottom price tag	•	•	•	•	•	•	•	34	49	70	45	170g	
50mm f/1.4	£369	2/10	5★	While this lens performs well overall, performance at f/1.4 could be better	•	•	•	•	•	•	•	45	55	65.5	43	220g	
50mm f/1.4 ZA SSM	£1300	Web	4★	Carl Zeiss design said to be ideal for quality-critical portraiture and low-light shooting	•	•	•	•	•	•	•	45	72	81	71.5	518g	
50mm f/2.8 Macro	£529	NYT		A macro lens with a floating lens element	•	•	•	•	•	•	•	20	55	71.5	60	295g	
55-200mm f/4-5.6 DT SAM	£219	NYT		Designed for cropped-sensor DSLRs, with a Smooth Autofocus Motor	•	•	•	•	•	•	•	95	55	71.5	85	305g	
55-300mm f/4.5-5.6 DT SAM	£309	NYT		Compact, lightweight telephoto zoom offering smooth, silent operation	•	•	•	•	•	•	•	140	62	77	116.5	460g	
70-200mm f/2.8 G	£1889	NYT		Super Sonic Wave motor and a constant f/2.8 aperture in this pro-grade tele zoom	•	•	•	•	•	•	•	120	77	87	196.5	1340g	
70-200mm f/2.8 G SSM II	£TBC	NYT		High-performance G Series telephoto zoom lens	•	•	•	•	•	•	•	120	87	196.5	1340g		
70-200mm f/4 G OSS	£949	10/14	4★	Compact, lightweight telephoto zoom lens for full-frame E-mount bodies	•	•	•	•	•	•	•	100	72	80	175	840g	
70-300mm f/4.5-5.6 G SSM	£869	12/10	3.5★	G-series lens with ED elements, Super Sonic wave Motor and a circular aperture	•	•	•	•	•	•	•	120	62	82.5	135.5	760g	
70-400mm f/4-5.6 G SSM II	£1799	NYT		Redesign of original features a new LSI drive circuit and promises faster autofocus	•	•	•	•	•	•	•	150	77	95	196	1500g	
75-300mm f/4.5-5.6	£219	8/12	3★	Compact and lightweight zoom with a circular aperture	•	•	•	•	•	•	•	150	55	71	122	460g	
85mm f/1.4 ZA Planar T*	£1369	NYT		Fixed focal length lens aimed at indoor portraiture	•	•	•	•	•	•	•	85	72	81.5	72.5	560g	
85mm f/2.8 SAM	£219	NYT		A light, low price portraiture lens	•	•	•	•	•	•	•	60	55	70	52	175g	
100mm f/2.8 Macro	£659	NYT		Macro lens with circular aperture, double floating element and wide aperture	•	•	•	•	•	•	•	35	55	75	98.5	505g	
135mm f/1.8 ZA Sonnar T*	£1429	NYT		A bright, Carl Zeiss portrait telephoto lens	•	•	•	•	•	•	•	72	77	84	115	1004g	
135mm f/2.8 STF	£1119	NYT		Telephoto lens with defocus effects	•	•	•	•	•	•	•	87	80	80	99	730g	

TAMRON

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
10-24mm f/3.5-4.5 SP AF Di II LD Asph. IF	£511	2/10	3.5★	Good consistency at 10mm and 18mm, but a steep decline at 24mm	•	•	•	•	•	•	•	24	77	83.2	86.5	406g	
16-300mm f/3.5-6.3 Di II VC PZD Macro	£600	8/14	4★	Versatile megazoom, a very good all-in-one solution, as long as you won't need to enlarge to A2 size	•	•	•	•	•	•	•	39	67	99.5	75	540g	
17-50mm f/2.8 SP AF XR Di II LD Asph. IF	£450	2/09	4.5★	Very good optical performance, which peaks at f/5.6-8	•	•	•	•	•	•	•	27	67	74	81.7	434g	
17-50mm f/2.8 SP AF XR Di II VC LD Asph. IF	£541	4/10	4.5★	Very strong performance at longer focal lengths but weaker at the other end	•	•	•	•	•	•	•	29	72	79.6	94.5	570g	
18-200mm f/3.5-6.3 AF XR Di II LD Asph. IF Macro	£306	3/08	3★	Excellent CA control in the centre, but unremarkable wideangle performance	•	•	•	•	•	•	•	45	62	73	83.7	423g	
18-200mm f/3.5-6.3 AF XR Di II LD Asph. IF Macro	£580	NYT		A redefined all-in-one lens to replace a shorter kit lens	•	•	•	•	•	•	•	50	62	62	96.7	460g	
18-270mm f/3.5-6.3 AF XR Di II LD Asph. IF Macro	£613	1/10	4.5★	Much better results at shorter focal lengths than longer ones, but still impressive	•	•	•	•	•	•	•	49	72	79.6	101	550g	
18-270mm f/3.5-6.3 AF Di II VC LD Asph. IF Macro	£663	10/11	3★	The next-generation incarnation offers a new form of ultrasonic engine	•	•	•	•	•	•	•	49	62	74.4	88	450g	
24-70mm f/2.8 SP Di VC USD	£1099	10/12	5★	Fast zoom with image stabilisation for both full-frame and APS-C cameras	•	•	•	•	•	•	•	38	82	88.2	116.9	825g	
28-75mm f/2.8 SP AF XR Di LD Asph. IF Macro	£460	NYT		Standard zoom with constant f/2.8 aperture and minimum focusing distance of 33cm	•	•	•	•	•	•	•	33	67	73	92	510g	
28-300mm f/3.5-6.3 AF XR Di LD Asph. IF Macro	£664	NYT		A useful 10.7x zoom range and low-dispersion elements in this optic	•	•	•	•	•	•	•	49	62	73	83.7	420g	
60mm f/2 SP AF Di II LD IF Macro	£550	12/10	5★	Macro lens designed for APS-C sensor cameras, with 1:1 reproduction ratio	•	•	•	•	•	•	•	23	55	73	80	400g	
70-200mm f/2.8 SP AF Di LD IF Macro	£817	10/09	4★	No image stabilisation and no advanced AF system, but at this price it's a steal	•	•	•	•	•	•	•	95	77	89.5	194.3	1150g	
70-200mm f/2.8 Di VC USD	£TBC	NYT		Compact yet full-size telephoto zoom with vibration compensation	•	•	•	•	•	•	•	130	77	85.8	188.3	1470g	
70-300mm f/4-5.6 SP VC USD	£300	1/12	4★	Ultrasonic Silent Drive (USD) technology for focusing and Vibration Compensation	•	•	•	•	•	•	•	150	62	81.5	142.7	765g	
70-300mm f/4-5.6 AF Di LD Macro	£170	11/10	3.5★	Low dispersion glass and compatible with both full-frame and cropped-sensor DSLRs	•	•	•	•	•	•	•	95	62	76.6	116.5	435g	
90mm f/2.8 SP AF Di Macro	£470	11/09	4★	A very nice macro lens that is capable of producing some fine images	•	•	•	•	•	•	•	29	55	71.5	97	405g	
90mm f/2.8 Di Macro 1:1 VC USD	£TBC	NYT		Redesign of the 90mm f/2.8 SP AF Di Macro; comes with vibration compensation	•	•	•	•	•	•	•	30	58	115	76.4	550g	
150-600mm f/5-6.3 SP VC USD	£1150	6/14	4★	Longest focal length of any affordable enthusiast zoom on the market and produces excellent results	•	•	•	•	•	•	•	270	95	105.6	257.8	1951g	
180mm f/3.5 SP AF Di LD IF Macro	£896	11/10	5★	Two Low Dispersion elements and internal focusing system in this 1:1 macro lens	•	•	•	•	•	•	•	47	72	84.8	165.7	920g	
200-500mm f/5-6.3 SP AF Di LD IF	£1124	6/09	4.5★	A well-matched and consistent set of MTF curves, with good performance at f/8-11	•	•	•	•	•	•	•	250	86	93.5	227	1237g	

TOKINA

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Sony Alpha	Canon	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
AT-X 107 (10-17mm) f/3.5-4.5 AF DX Fisheye	£550	NYT		Fisheye zoom lens with Water Repellent coating and Super Low Dispersion glass		•	•	•	•	•	14	n/a	70	71.1	350g	
AT-X 116 (11-16mm) f/2.8 PRO DX	£515	6/12	4.5★	Wide zoom with a One-Touch Focus clutch mechanism and a constant f/2.8 aperture		•	•	•	•	•	30	77	n/a	89.2	560g	
AT-X 12-28mm f/4 PRO DX	£529	NYT		Replacement for 12-24mm F4 wideangle zoom; for Nikon DX DSLRs		-	•	•	•	•	25	77	84	90	600g	
AT-X 16-28mm f/2.8 PRO FX	£757	6/11	5★	A pro-end wideangle zoom aimed at full frame cameras		•	•	•	•	•	26	n/a	90	133	950g	
AT-X 17-35mm f/4 PRO FX	£830	11/12	5★	One of the most capable super-wide zooms available, though only available in Canon and Nikon mounts		•	•	•	•	•	28	82	89	94	600g	
AT-X 16.5-135 (16.5-135mm) f/3.5-5.6	£610	9/11	3.5★	Three aspherical and two SD elements, together with a useful focal range		•	•	•	•	•	50	77	84	78	610g	
AT-X M100 (100mm) f/2.8 AF PRO D Macro	£360	11/09	4★	Some weaknesses wide-open, but reasonable MTF curves make this a decent optic		•	•	•	•	•	30	55	73	95.1	540g	

ZEISS

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Sony Alpha	Canon	Nikon	Pentax	Sigma	Full Frame Only	Min Focus(cm)	Filter Thread (mm)	Width(mm)	Length(mm)	Weight
12mm f/2.8 Touit Distagon T*	£959	5/14	5★	Designed specifically for Sony NEX and Fujifilm X-series CSC cameras. Very impressive performance		•	•	•	•	•	18	67	68	270g		
18mm f/3.5 ZF.2	£1150	8/10	5★	No AF, but the optical and build qualities of this lens are nothing short of stunning		•	•	•	•	•	30	82	84	87	470g	
21mm f/2.8 Distagon T*	£1579	NYT		A wideangle lens that doesn't compromise on optical quality		•	•	•	•	•	30	82	87	84	510g	
25mm f/2 Distagon T*	£1350	NYT		A landscape lens with a fast aperture		•	•	•	•	•	25	67	71	95	570g	
25mm f/2.8 Distagon T*	£750	NYT		A macro lens offering unrivalled quality		•	•	•	•	•	17	58	83	55	480g	
28mm f/2 Distagon T*	£850	NYT		For low light shooting the 28mm lens has plenty of potential		•	•	•	•	•	24	58	64	93	520g	
32mm f/1.8 Touit Planar T*	£700	7/14	4.5★	Optimised for use with APS-C format sensors, a fast standard lens for Fujifilm X-series cameras		•	•	•	•	•	23	52	72	76	200g	
35mm f/1.4 Distagon T*	£1600	NYT		Promises to produce some stunning bokeh effects		•	•	•	•	•	30	72	120	122	850g	
35mm f/2 Distagon T*	£940	NYT		An extremely fast focusing lens		•	•	•	•	•	30	58	64	97	530g	
50mm f/1.4 Planar T*	£650	NYT		A portrait lens in its element in low light		•	•	•	•	•	45	72	66	69	350g	
50mm f/2 Makro-Planar	£665	NYT		A macro lens with impressive-looking levels of sharpness		•	•	•	•	•	24	67	72	88	530g	
100mm f/2 Makro-Planar	£1399	NYT		A rapid-focus portrait lens		•	•	•	•	•	44	72	76	113	680g	

CSC Lens Listings

The range of lenses for CSC models is constantly evolving, so you have a fairly good choice when it comes to lenses for your CSC

CANON CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Canon M	Micro 4/3rds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fujifilm X Mount	Full Frame Only	Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
EF-M 18-55mm f/3.5-5.6 IS STM	£269	NYT		Compact and versatile zoom lens		•	•	•	•	•	•	25	52	61	61	210g		
EF-M 11-22mm f/4-5.6 IS STM	£355	NYT		Ultra-wideangle lens with a compact, retractable lens design		•	•	•	•	•	•	15	55	61	58.2	220g		
EF-M 22mm f/2 STM	£220	NYT		Small and bright wideangle pancake lens		•	•	•	•	•	•	15	43	61	23.7	105g		
EF-M 55-200mm f/4.5-6.3 IS STM	£330	NYT		Telephoto zoom that takes you closer to the action		•	•	•	•	•	•	100	52	60.9	86.5	260g		

FUJI CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Canon M	Micro 4/3rds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fujifilm X Mount	Full Frame Only	Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
XF 10-24mm f/4 R OIS	£849	NYT		Ultra wideangle lens, minimal ghosting with Fujis HT-EBC multi-layer coating		•	•	•	•	•	•	24	72	78	87	410		
XF 14mm f/2.8 R	£729	7/13	5★	Ultra wideangle prime, high resolution to all corners, performance justifies price tag		•	•	•	•	•	•	18	58	65	58.4	235g		
XC 16-50 f/3.5-5.6 OIS	£359	NYT		Lightweight lens for mirrorless X-series offers 24-75mm equivalent zoom range		•	•	•	•	•	•	30	58	62.6	98.3	195g		
XF 16-55mm f/2.8 R LM WR	£899	06/15	5★	A flagship XF standard zoom lens with a constant f/2.8 aperture and weather-resistance		•	•	•	•	•	•	60	77	83.3	106	655g		
XF 18mm f/2 R	£430	6/13	4★	A compact, wideangle lens with a quick aperture		•	•	•	•	•	•	18	52	64.5	40.6	116g		
XF 18-135mm f/3.5-5.6 R LM OIS WR	£699	Xmas14	4★	Weather-resistant zoom for Fujifilm X mount, designed to be the perfect partner for the Fujifilm X-T1		•	•	•	•	•	•	45	77	75.7	97.8	490g		
XF 18-55mm f/2.8-4 R	£599	NYT		Short zoom lens with optical image stabilisation		•	•	•	•	•	•	18	58	65	70.4	310g		
XF 23mm f/1.4 R	£649	NYT		Premium wide-angle prime lens with fast maximum aperture		•	•	•	•	•	•	28	62	72	63	300g		
XF 27mm f/2.8	£270	NYT		A high-performance single-focal-length lens		•	•	•	•	•	•	60	39	23	61.2	78g		
XF 35mm f/1.4 R	£439	6/13	4★	Shallow depth of field and bokeh effects are simple to achieve with this lens		•	•	•	•	•	•	28	52	65	54.9	187g		
XF 50-140mm f/2.8 R LM OIS WR	£1249	NYT		A telephoto zoom with a constant maximum aperture and weather-resistance		•	•	•	•	•	•	100	72	82.9	175.9	995g		
XC 50-230mm f/4.5-6.7 OIS	£315	NYT		The XC lens range is designed to suit Fuji's mid range CSCs, and this lens has optical image stabilization		•	•	•	•	•	•	110	58	69.5	111	tbc		
XF 55-200mm f/3.5-4.8 R LM OIS	£599	11/13	4★	Telephoto with built-in optical image stabilisation plus aperture control ring		•	•	•	•	•	•	110	62	118	75	580g		
XF 56mm f/1.2 R	£899	9/14	4★	This wide-aperture portrait lens for X series cameras has great sharpness and detail and is great value		•	•	•	•	•	•	70	62	73.2	69.7	405g		
XF 56mm f/1.2 R APD	£1090	NYT		Medium-telephoto prime lens, with fast f/1.2 lens and built-in APD filter producing creamy bokeh		•	•	•	•	•	•	70	62	73.2	69.7	405g		
XF 60mm f/2.4 XF R Macro	£599	NYT		A short telephoto lens perfect for macro work		•	•	•	•	•	•	26.7	39	64.1	70.9	215g		

NIKON CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Canon M	Micro 4/3rds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fuji X Mount	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
											MOUNT		DIMENSIONS					
6.7-13mm f/3.5-5.6 VR 1	£459	NYT		Compact, lightweight, ultra-wide angle zoom lens with Vibration Reduction for Nikon 1 system	•				•				25	52	56.5	46	125g	
10mm f/2.8	£229	2/12	4★	A wideangle lens for Nikon's series of Compact System Cameras					•				20	40.5	55.5	22	77g	
10-30mm f/3.5-5.6 VR	£149	NYT		Nikon's kit lens for the 1 series of CSC models	•				•				20	40.5	57.5	42	115g	
10-100mm f/4.5-5.6 VR PD-ZOOM	£679	NYT		A powered zoom lens aided by the VR image stabilisation system on 1 system compact	•				•				300	72	77	95	530g	
10-100mm f/4-5.6 VR 1	£499	NYT		CX-format zoom lens with focal length range of 10-100mm (27-270mm 35mm equivalent)	•				•				35	55	60.5	70.5	298g	
11-27.5mm f/3.5-5.6	£179	NYT		Compact standard zoom for Nikon 1 system					•				30	40.5	57.5	31	80g	
18.5mm f/1.8	£179	NYT		Nikon's 1 series gains a traditional fast prime					•				20	40.5	56	36	70g	
30-110mm f/3.8-5.6 VR	£229	NYT		A longer zoom lens, with image stabilisation, for the Nikon 1 series	•				•				100	40.5	60	61	180g	
32mm f/1.2	£799	NYT		First 1 system lens to offer a silent wave motor and nano crystal coating	•				•				45	52	66	47	235g	
70-300mm f/4.5-5.6 VR	£TBC	NYT		CX-format super-telephoto lens with a surprisingly compact body	•				•				7	62	73	108	550g	

OLYMPUS CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Canon M	Micro 4/3rds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fuji X Mount	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
											MOUNT		DIMENSIONS					
9-18mm (Micro) f/4-5.6 ED	£630	NYT		This super wideangle lens offers an equivalent focal range of 18-36mm in 35mm terms									25	52	56.5	49.5	155g	
12mm (Micro) f/2.0 ED	£739	1/12	5★	A wideangle fixed lens for the Micro Four Thirds system	•								20	46	56	43	130g	
12-40mm f/2.8	£899	NYT		Weather-resistant wideangle zoom with a constant aperture of f/2.8									20	62	69.9	84	382g	
12-50mm (Micro) f/3.5-6.3 ED EZ	£349	NYT		A reasonably-priced MFT zoom lens									20	52	57	83	211g	
17mm M.Zuiko f/1.8 MSC	£450	7/13	5★	Wide-aperture, wide-angle prime boasting excellent peak sharpness and no colour fringing									25	46	57	35	120g	
17mm (Micro) f/2.8 Pancake	£300	5/10	4★	Results are impressive across the most-used apertures given the wide angle of view offered									20	37	57	22	71g	
14-42mm (Micro) f/3.5-5.6 ED	£300	5/10	4★	Generally a good performer, but control over chromatic aberrations could be a little better									25	40.5	62	43.5	150g	
14-42mm II R (Micro) f/3.5-5.6 II	£269	NYT		A redesigned variation of the standard kit lens									25	37	56.5	50	112g	
14-150mm (Micro) f/4-5.6 ED	£630	NYT		Plenty of focal range is offered by this MFT lens									50	58	63.5	83	280g	
14-150mm f/4-5.6 II	£550	NYT		High-powered zoom for all your needs – from wideangle to telephoto – plus weather-resistance									50	58	63.5	83	285g	
25mm f/1.8	£370	NYT		Compact prime lens with ultra-bright f/1.8 aperture	•								25	46	57.8	42	137g	
40-150mm f/2.8 ED	£1299	03/15	4★	This powerful 80-300mm 35mm equivalent focal length lens offers amazing portability for this pro class									70	72	79.4	160	760g	
40-150mm R (Micro) f/4-5.6	£309	NYT		This middle-distance zoom lens has an 80-300mm 35mm equivalent focal length									90	58	63.5	83	190g	
45mm (Micro) f/1.8	£279	2/12	5★	Fast-aperture lens for taking portrait shots proved to be sharp, quiet and without colour fringing									50	37	56	46	116g	
60mm f/2.8 Macro	£450	NYT		High-precision macro lens that's dustproof and splashproof									19	46	56	82	185g	
75-300mm II (Micro) f/4.8-6.7	£499	NYT		Update featuring Zuiko Extra-low Reflection Optical coating said to reduce ghosting									90	58	69	117	423g	
75mm f/1.8 ED	£799	8/13	5★	Ultra-fast prime lens ideal for portraits and action shots									84	58	64	69	305g	

PANASONIC CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Canon M	Micro 4/3rds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fuji X Mount	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
											MOUNT		DIMENSIONS					
G 7-14mm f/4	£1300	5/10	5★	For a wideangle zoom, the overall level of resolution is very impressive									25	-	70	83.1	300g	
G 8mm Fisheye f/3.5	£730	NYT		The world's lightest and smallest fisheye lens for an interchangeable lens camera									10	22	60.7	51.7	165g	
G 12mm 3D Lens f/12	£320	NYT		Allows compatible cameras to shoot 3D images									60	-	57	81.8	45g	
G 12-32mm f/3.5-5.6 MEGA OIS	£270	NYT		Very compact with a versatile zoom range and 3 aspherical lenses									20	37	55.5	24	70g	
G X 12-35mm f/2.8 X PZ POWER OIS	£1095	10/12	5★	Fast, high-quality standard zoom for Micro Four Thirds cameras									25	58	67.6	73.8	305g	
G 14mm f/2.5	£249	NYT		Wideangle pancake lens which should suit landscape photographers									18	46	55.5	20.5	55g	
G 14-42mm II f/3.5-5.6 MEGA OIS	£375	NYT		Addition of two aspherical elements helps make this lens smaller than previous version									20	46	56	49	110g	
G X 14-42mm f/3.5-5.6 X PZ POWER OIS	£369	2/13	4★	Powered zoom; impressive results in terms of both sharpness and chromatic aberration									20	37	61	26.8	95g	
G 14-45mm f/3.5-5.6 MEGA OIS	£189	NYT		A lightweight and compact standard zoom featuring MEGA O.I.S. optical image stabilisation									30	52	60	60	195g	
G 14-140mm f/3.5-5.6 POWER OIS	£599	NYT		Metal-bodied zoom featuring company's POWER O.I.S. optical image stabiliser									30	58	67	75	265g	
DG 15mm f/1.7 Leica DG SUMMILUX	£549	NYT		High-speed prime with a compact metal body and includes 3 aspherical lenses to cut down distortion									20	46	36	57.5	115g	
G 20mm f/1.7	£300	NYT		High-speed prime (40mm is the 35mm camera equivalent) with 2 aspherical lenses									20	46	63	25.5	100g	
DG 25mm f/1.4 DG SUMMILUX	£550	2/12	5★	A fast-aperture fixed focal length standard lens from Leica									30	46	63	54.5	200g	
G 30mm f/2.8 Macro MEGA OIS	£300	07/15	3★	Compact lens offering true-to-life magnification capability for better macro images									10	46	58.8	63.5	180g	
35-100mm E f/4-5.6 MEGA OIS	£300	NYT		Telephoto zoom equivalent to 70-200mm on a 35mm camera									90	46	55.5	50	135g	
G X 35-100mm f/2.8 POWER OIS	£1099	NYT		Telephoto zoom with Nano Surface Coating technology for dramatic reduction of ghosting and flare									85	58	67.4	100	360g	
42.5mm f/1.2 Leica DG POWER OIS	£1399	Web	5★	Mid-telephoto high-speed LEICA DG NOCTICRON lens with 2 aspherical lenses and ultra-wide aperture									50	67	74	76.8	425g	
G 42.5mm f/1.7 POWER OIS	£349	NYT		Mid-telephoto lens with a 35mm equivalent of 85mm, its f/1.7 aperture promises a beautiful bokeh effect									37	31	55	50	130g	
G 45-150mm f/4-5.6 MEGA OIS	£280	2/13	4★	Compact, lightweight telephoto zoom comprising 12 elements in 9 groups									90	52	62	73	200g	
DG Macro 45mm f/2.8 MEGA OIS	£730	5/10	4.5★	Although maximum and minimum aperture are a tad weak, mid-range scores impress									15	46	63	62.5	225g	
G X 45-175mm f/4-5.6 X PZ POWER OIS	£400	7/12	4★	A powered long focal length zoom lens									90	46	61.6	90	210g	
G 45-200mm f/4-5.6 MEGA OIS	£330	7/12	4★	Superzoom lens with three ED elements and Mega O.I.S. technology									100	52	70	100	380g	
G 100-300mm f/4-5.6 MEGA OIS	£550	7/11	4★	Long zoom lens offering optical image stabilization									100	52	70	100	380g	

PENTAX CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Canon M	Micro 4/3rds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fuji X Mount	Full Frame Only	Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
3.8mm-5.9mm (Q System) f/3.7-4	£429	NYT		Super-compact, ultra-lightweight wide zoom, equivalent to 17.5-27mm in the 35mm format										25	49	38	54	75g
8.5mm (Q System) f/2.8	£780	NYT		The standard prime lens in the Q system										30	40.5	48.5	48	96g
6.3mm (Q System) f/7.1	£129	NYT		A wide lens for the Q system										N/A	40.6	25	21g	
11.5mm (Q System) f/9	£49	NYT		Extremely thin Mount Shield Lens equivalent to 53mm in the 35mm format, offering a distinctive, velvety image										30	N/A	6.9	40.8	8g
15-45mm (Q System) f/7.1	£249	NYT		Telephoto zoom covers focal lengths between 83mm and 249mm in 35mm terms										40	50	56	90g	
18mm (Q System) f/8	£129	NYT		A telephoto lens for the Q system										N/A	40.6	19.5	18g	
3.2mm (Q System) f/5.6	£149	NYT		A fisheye lens for the Q system										90	N/A	40.6	30.5	29g
5-15mm (Q System) f/2.8	£279	NYT		A short zoom lens for the Q system										40.5	45.5	23	37g	
15-45mm (Q System) f/2.8	£279	NYT		A telephoto lens for the Q system that's super-compact and ultra-lightweight										100	40.5	56	50	90g

SAMSUNG CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Canon M	Micro 4/3rds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fuji X Mount	Full Frame Only	Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
9mm f/3.5 ED	£149	NYT		At 12.5mm thin, this pancake lens is constructed of solid metal, made for the NX Mini only										11	N/A	50	12.5	31g
9-27mm f/3.5-5.6 ED OIS	£199	NYT		Versatile and compact zoom lens - NX-M mount for NX Mini only	•									14	40.5	50	29.5	73g
10mm f/3.5 fisheye	£399	NYT		Lightweight and compact, this versatile fisheye lens can be used with a wide range of Smart NX cameras	•									9	N/A	58.8	26.3	72g
17mm NX-M f/1.8 OIS	£160	NYT		Portrait prime lens designed with an NX-M Mount for the NX Mini	•									18	39	50	28	55g
12-24mm f/4-5.6 ED	£480	NYT		Portable ultra-wideangle zoom lens with i-function	•									24	58	63.5	65.5	208g
16mm NX i-Function f/2.4	£299	NYT		A pancake lens with a wide angle of view	•									18	43	61	24	90g
16-50mm f/2-2.8 Premium S ED OIS	£999	NYT		Bright-aperture zoom lens made of metal, with quiet AF performance whether shooting stills or video	•									30	72	81	96.5	622g
16-50mm f/3.5-5.6 Power Zoom	£279	NYT		Ultra-compact and lightweight design	•									24	43	64.8	31	111g
20-50mm f/3.5-5.6 ED II	£199	NYT		Ultra-compact lens with a retractable design. It's lightweight and an ideal optic for travelling	•									28	40.5	63.2	39.8	119g
18-55mm NX i-Function OIS f/3.5-5.6	£199	9/10	4.5★	Not an outstanding set of MTF curves but acceptable nevertheless. Weaker at 18mm	•									28	58	63	65	198g
18-200mm NX i-Function OIS f/3.5-6.3	£649	9/12	4.5★	A mid-range zoom lens aimed at movie making	•									50	67	72	105.5	549g
20mm NX i-Function f/2.8	£229	2/12	5★	Wideangle pancake lens	•									17	43	62	25	89g
30mm NX i-Function f/2	£249	9/10	4★	This pancake optic exhibits very impressive peak sharpness at around f/4-5.6	•									25	43	61	21	85g
45mm NX i-Function f/1.8	£249	NYT		Fast f/1.8 aperture produces a shallow depth of field making it ideal for portraiture	•									45	43	62	44.5	115g
45mm NX i-Function f/1.8 2D/3D	£399	NYT		Delivers high-end 3D capabilities with a large aperture and smooth autofocus system	•									50	43	62	44.5	122g
50-150mm f/2.8 S ED OIS	£1199	NYT		Premium zoom lens with advanced OIS, constant f/2.8 aperture, and dust and splash-resistant	•									70	72	81	154	915g
50-200mm NX i-Function ED OIS III f/4-5.6	£249	9/10	4★	Performance at the 50mm end is good, though this drops off at the tele end	•									98	52	70	100	417g
60mm NX i-Function Macro ED SSA OIS f/2.8	£499	2/12	5★	This prime lens with macro capability should be useful for portraiture	•									18	52	73.5	84	389g
85mm NX i-Function ED SSA OIS f/1.4	£849	4/12	5★	This prime lens is missing image stabilisation, but should still perform well	•									82	67	79	92	714g

SIGMA CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Canon M	Micro 4/3rds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fuji X Mount	Full Frame Only	Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
19mm f/2.8 DN A	£189	NYT		Metal-bodied high-performance wideangle prime lens										20	46	60.8	45.7	150g
30mm f/2.8 DN A	£189	NYT		Uses a high-quality double-sided aspherical lens for expressive performance worthy of Sigma's 'Art' line										30	46	60.8	40.5	140g
60mm f/2.8 DN A	£189	NYT		Latest addition to Sigma's 'Art' range is a mid-range, high-performance telephoto lens with metal body										50	46	60.8	55.5	190g

SONY CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Canon M	Micro 4/3rds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fuji X Mount	Full Frame Only	Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
10-18mm f/4	£750	8/13	4★	Super wideangle zoom with Super ED glass and Optical SteadyShot image stabilisation	•									25	62	70	63.5	225g
16mm f/2.8	£220	2/12	4★	Pancake lens for NEX system, with a circular aperture and Direct Manual Focus	•									24	49	62	22.5	67g
16-35mm f/4 ZA OSS Vario-Tessar T* FE	£1289	1/15	5★	Zeiss full frame wideangle zoom lens	•									28	72	78	98.5	518g
16-50mm f/3.5-5.6 OSS	£299	NYT		Compact lens with Power Zoom, ED glass and Optical SteadyShot image stabilisation	•									25	40.5	64.7	29.9	116g
16-70mm f/4 ZA OSS Vario-Tessar T*	£839	NYT		A lightweight, versatile mid-range zoom with a constant f/4 aperture	•									35	55	66.6	75	308g
18-55mm f/3.5-5.6 OSS	£270	NYT		Optical SteadyShot, said to be silent during movie capture, and a circular aperture	•									25	49	62	60	194g
18-105mm f/4 G OSS	£499	NYT		Sony G lens for E-mount cameras with a constant f/4 aperture	•									45	72	78	110	427g
18-200mm f/3.5-6.3 OSS LE	£489	NYT		Smaller and lighter than comparable lenses, this is an ideal high-magnification travel lens	•									50	62	68	98	460g
18-200mm PZ f/3.5-6.3 OSS	£999	NYT		Boasts powered zoom and image stabilisation with Active Mode, making it ideal for movies	•									30	67	93.2	99	649g
20mm f/2.8	£309	NYT		Pancake wideangle lens promises to be the perfect walkaround partner for E mount cameras	•									20	49	62.6	20.4	69g
24mm f/1.8 ZA Sonnar T*	£839	NYT		Top quality Carl Zeiss optic ideally suited to the NEX-7	•									16	49	63	65.6	225g
24-240mm f/3.5-6.3 OSS	£929	NYT		Ideal for travel, landscapes and more, with built-in stabilisation and also dust and moisture resistant	•									50	72	80.5	118.5	780g
24-70mm f/4 ZA OSS Vario-Tessar T*	£1049	NYT		Compact lens with an f/4 maximum aperture across the zoom range and built-in image stabilisation	•									40	67	73	94.5	426g
28mm f/2	£419	NYT		This full-frame wideangle prime with a bright f/2.0 maximum aperture promises excellent sharpness	•									29	49	64	60	200g
28-70mm f/3.5-5.6 OSS	£449	NYT		Built-in Optical SteadyShot image stabilisation, lightweight, and a popular zoom range	•									30	55	72.5	83	295g
28-135mm PZ f/4 G OSS	£2379	NYT		High performance G Series standard zoom lens, constant f/4 aperture, built for high quality moviemaking	•									95	95	162.5	105	1215g
30mm f/3.5 Macro	£219	NYT		A macro lens for the NEX Compact System Cameras	•									9	49	62	55.5	138g
35mm f/1.4 ZA Distagon T*	£1559	NYT		Full-frame ZEISS Distagon lens with large, bright f/1.4 aperture	•									30	72	73	94.5	630g
35mm f/1.8	£399	NYT		Lightweight versatile prime with Optical SteadyShot image stabilisation	•									30	49	62.2	45	155g
35mm f/2.8 ZA Sonnar T*	£699	NYT		When coupled with a full frame Sony E-mount camera, this prime lens promises to deliver	•									35	49	61.5	36.5	120g
50mm f/1.8	£219	NYT		A handy, low price portrait lens for the NEX range	•									39	49	62	62	202g
55mm f/1.8 ZA Sonnar T*	£849	NYT		35mm full frame prime lens with wide aperture allowing good images indoors or in low light	•									50	49	64.4	70.5	281g
55-210mm f/4.5-6.3 OSS	£289	NYT		Lightweight telephoto zoom lens for the NEX range	•									100	49	63.8	108	345g
70-200mm f/4 G OSS	£1359	10/14	4★	G Series telephoto zoom lens, dust and water resistant, with built-in image stabilisation	•									100	72	80	175	840g



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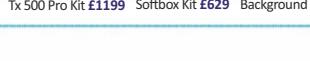
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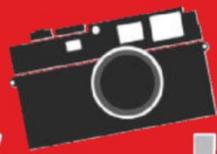
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4/3rds Lenses	Optium 11-22mm F2.8-3.5 Zulko.....	ETRIS Body + Speed Grip.....	E++ £389	600mm F6 + Leather Case.....	E+ £369	GFS + 14-42 mm - Leather	E+ £299	135mm F3.2 HC.....	E+ £299	
12-20mm F2.4 ED SWD.....	E+ / Mint- £249 - £299	30mm F3.5 PE Fishey.....	E++ £589 - £699	600mm F6 + Leather Case.....	Mint- £7,999	GFS + 14-42 mm - Case	Unused £239	135mm F3.2 HC.....	E+ £165	
14-35mm F2 SWD.....	E++ / Mint- £989 - £1,049	40mm F4.5 PE.....	E++ £399	10-20mm F4.5-6.6 DC HSM.....	E+ £219	Nikon Coolpix 950	As Seen £299	135mm F3.2 HC.....	E+ £165	
14-54mm F2.8-3.5 Zulko.....	E++ £149	70-140mm F4.5 PE.....	E+ £139	10-20mm F4.5-6.6 DC HSM.....	E+ £219	Nikon Coolpix 990	As Seen £299	135mm F3.2 HC.....	E+ £165	
25mm F2.8 Zulko.....	E++ £139	150mm F3.5 E.....	As Seen / E++ £39 - £109	12-24mm F4.5-6.6 DC HSM M101.....	E+ £399	Nikon Coolpix 990	E+ / Mint- £99 - £29	135mm F3.2 HC.....	E+ £165	
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40-150mm F4.5-6.6 ED Zulko.....	E+ / E++ £59 - £129	240mm F5.6 E.....	E+ / E++ £129	12-24mm F4.5-6.6 DC HSM.....	E+ £219	Nikon Coolpix 990	E+ / Mint- £99 - £29	135mm F3.2 HC.....	E+ £165	
50-200mm F3.8-5.3 Zulko.....	E+ / E++ £59 - £129	250mm F5.6 E.....	E+ / E++ £129	12-24mm F4.5-6.6 DC HSM.....	E+ £219	Nikon Coolpix 990	E+ / Mint- £99 - £29	135mm F3.2 HC.....	E+ £165	
7-14mm F4 ED Zulko.....	E++ £749 - £789	2x Converter E.....	E+ £59	50mm F1.4 EX DG HSM.....	E++ £219 - £229	Olympus SP-620 Ultra Zoom	E+ £79	NEX 3 + 18-55mm + Flash	E++ £1,099	
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18mm F1.8-6.6 ED Zulko.....	E+ / E++ £279	Roller Finder E.....	E+ £79	70-300mm F4.5-6.6 Apo Macro.....	E++ £559	Stylus 1 + TCON-17x Conv	E++ £389	NEX 3 + 18-55mm + Flash	E++ £1,099	
Panasonic 14-150mm F3.5-5.6 Asph Varo-Eitaro D.....	Waist Level Finder E.....	E+ £35	70mm F2.8 EX DG Macro.....	E+ / E++ £229 - £239	Rolex Compactline 150	E++ £25	NEX 3 + 18-55mm + Flash	E++ £1,099		
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17mm F2.8 M Zulko.....	E+ / £119 - £129	12-24mm F4 ATX PRO SD Tokina.....	E+ / £279	300mm F2.8 Apo EX DG HSM.....	E+ £1,899	Stylus 1 + TCON-17x Conv	E++ £389	NEX 3 + 18-55mm + Flash	E++ £1,099	
40-150mm F4.5-6.6 ED M Zulko.....	E+ / £149 - £179	14mm F2.8 L USM.....	E+ / £149	300mm F4 Apo EX HSM.....	E+ / E++ £159 - £199	Rolex Compactline 150	E++ £25	NEX 3 + 18-55mm + Flash	E++ £1,099	
45mm F1.8 M Zulko.....	E+ / Mint- £149 - £179	14mm F2.8 L USM II.....	E+ / £149	300mm F4 Apo EX HSM.....	E+ / E++ £159 - £199	Compactline 80	E++ £29	NEX 3 + 18-55mm + Flash	E++ £1,099	
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2.5mm F2.6 3d.....	Mint- £109	16-30mm F2.8 ATX Pro DX Tokina.....	E+ / £239	300mm F4 Apo EX HSM.....	E+ / E++ £159 - £199	Rolex Compactline 150	E++ £25	NEX 3 + 18-55mm + Flash	E++ £1,099	
14-140mm F3.5-5.6 OIS HD.....	E+ / £249	17-40mm F4.0 L USM.....	E+ / £249	300mm F4 Apo EX HSM.....	E+ / E++ £159 - £199	Compactline 80	E++ £29	NEX 3 + 18-55mm + Flash	E++ £1,099	
14-42mm F3.5-5.6 Asph OIS.....	E+ / E++ £69 - £79	17-55mm F2.8 EFS USM.....	E+ / £429	300mm F4 Apo EX HSM.....	E+ / E++ £159 - £199	Samsung EX1	Mint- £149	NEX 3 + 18-55mm + Flash	E++ £1,099	
14mm F2.8 Asph.....	Mint- £119	17-55mm F2.8 EFS USM.....	E+ / £429	300mm F4 Apo EX HSM.....	E+ / E++ £159 - £199	SP820 Ultra Zoom	E+ £79	NEX 3 + 18-55mm + Flash	E++ £1,099	
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25mm F1.4 D Summilux.....	E+ / Mint- £299 - £349	18-35mm F3.5-5.6 IS USM.....	E+ / £189	300mm F4 Apo EX HSM.....	E+ / E++ £159 - £199	Rolex Compactline 150	E++ £25	NEX 3 + 18-55mm + Flash	E++ £1,099	
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10-30 x50 Zoom Praktica	E+ / £25	70-200mm F4.0 L USM.....	E+ / £25	70-200mm F4.0 L USM.....	E+ / £25	Powershot G100	E+ / £59	Leica M		
10-22x40 Action	E+ / £249	75-350mm F3.4-5.5 MM Contax.....	E+ / £449	75-350mm F3.4-5.5 MM Contax.....	E+ / £449	Powershot G100	E+ / £59	Leica M		
10x20 HCD Binoculars	E+ / £99	75-350mm F3.4-5.5 L USM.....	Mint- £99	75-350mm F3.4-5.5 L USM.....	Mint- £99	Powershot G100	E+ / £59	Leica M		
7x42 Alpine	E+ / £29	76mm F2.8 EFS Macro.....	E+ / £209	76mm F2.8 EFS Macro.....	E+ / £209	Powershot G100	E+ / £59	Leica M		
8x40 Alpine	E+ / £79	75mm F2.8 MP-E Macro.....	Mint- £649	75mm F2.8 MP-E Macro.....	E+ / £649	Powershot G100	E+ / £59	Leica M		
10-30 x50 Close Celestron	Mint- £29	70-200mm F4.1 L USM.....	E+ / £649	70-200mm F4.1 L USM.....	E+ / £649	Powershot G100	E+ / £59	Leica M		
10-30 x50 Zoom Praktica	E+ / £25	70-200mm F4.0 L USM.....	E+ / £25	70-200mm F4.0 L USM.....	E+ / £25	Powershot G100	E+ / £59	Leica M		
10-24 UCF Compact Pentax	E+ / £59	70-210mm F4.0 FZ EF.....	E+ / £149	70-210mm F4.0 FZ EF.....	E+ / £149	Powershot G100	E+ / £59	Leica M		
10x40 Doppel	Unused £349	70-300mm F4.5-5.6 IS Tamron.....	E+ / £449	70-300mm F4.5-5.6 IS Tamron.....	E+ / £449	Powershot G100	E+ / £59	Leica M		
10x42 Innova Acuter.....	E+ / £19	70-300mm F4.5-5.6 DC V100 Tamron.....	E+ / £199	70-300mm F4.5-5.6 DC V100 Tamron.....	E+ / £199	Powershot G100	E+ / £59	Leica M		
10x42 Nature Celestron	E+ / £39	70-300mm F4.5-5.6 L USM.....	E+ / Mint- £739 - £799	70-300mm F4.5-5.6 L USM.....	E+ / Mint- £739 - £799	Powershot G100	E+ / £59	Leica M		
10x50 CF WP Binocular Pentax	Mint- £139	70-300mm F4.5-5.6 L USM.....	E+ / £45	70-300mm F4.5-5.6 L USM.....	E+ / £45	Powershot G100	E+ / £59	Leica M		
16x50 ZCF Vanguard	E+ / £59	70-300mm F4.5-5.6 L USM.....	Mint- £59	70-300mm F4.5-5.6 L USM.....	Mint- £59	Powershot G100	E+ / £59	Leica M		
20x50 ZCF Praktica	E+ / £25	70-300mm F4.5-5.6 EF III.....	As Seen / E+ / £39 - £79	70-300mm F4.5-5.6 EF III.....	As Seen / E+ / £39 - £79	Powershot G100	E+ / £59	Leica M		
7-15x35 Zoon Binos Tasco	E+ / £29	70-200mm F4.2 FZ EF.....	E+ / £449	70-200mm F4.2 FZ EF.....	E+ / £449	Powershot G100	E+ / £59	Leica M		
8x42 EXP Olympus	E+ / £199	85mm F1.2 L USM Macro.....	E+ / £1,099	85mm F1.2 L USM Macro.....	E+ / £1,099	Powershot G100	E+ / £59	Leica M		
8x42 HR Binos Vining	E+ / £74	85mm F1.2 L USM Macro.....	E+ / £1,099	85mm F1.2 L USM Macro.....	E+ / £1,099	Powershot G100	E+ / £59	Leica M		
8x42 Skywatcher Pro Steiner	E+ / £199	85mm F1.2 L USM Macro.....	E+ / £1,099	85mm F1.2 L USM Macro.....	E+ / £1,099	Powershot G100	E+ / £59	Leica M		
8x42 Monocular	E+ / £59	90mm F2.8 TSE Shift.....	Mint- £79	90mm F2.8 TSE Shift.....	Mint- £79	Powershot G100	E+ / £59	Leica M		
Pentax 10x42 CF WP Vanguard	Mint- £299	100-400mm F4.5-5.6 L USM.....	E+ / £649 - £799	100mm F1.2 L USM Macro.....	Mint- £1,099	Powershot G100	E+ / £59	Leica M		
SLX 8x24 D30sTels.....	As Seen £149	100mm F2.8 L Macro USM.....	Mint- £519	100mm F2.8 L Macro USM.....	Mint- £519	Powershot G100	E+ / £59	Leica M		
6x30 Jena Silmar.....	As Seen £35	100mm F3.5 L Macro USM.....	E+ / £649	100mm F1.0 L USM Macro.....	E+ / £649	Powershot G100	E+ / £59	Leica M		
7x42 B T DIALYT	E+ / £549	200-500mm F5.6-3.5 LD AF Tamron.....	E+ / £249	100mm F1.0 L USM Macro.....	E+ / £649	Powershot G100	E+ / £59	Leica M		
8x24 Jena Deltur.....	Exc £169	300mm F2.8 ATX SD Tokina.....	E+ / £649	100mm F1.0 L USM Macro.....	E+ / £649	Powershot G100	E+ / £59	Leica M		
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180mm F4.5 Macro.....	E++ £199	28-200mm F4-5.6.....	E+ £45	16mm F2.8 AIS Fisheye.....
75mm F3.5 KL.....	E++ £199	28-70mm F2.8 EX.....	E++ £149	24mm F2 AIS.....
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180mm F4.5 Macro.....	As Seen £69	28mm F1.8 EX DG.....	E++ £259	24mm F2.8 AIS.....
180mm F4.5 C.....	As Seen £75	50mm F1.4 EX DG HSM.....	E+ £239	25-50mm F4 AIS.....
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Pro SD 120 Mag (6x4.5cm).....	Mint- £69	135-400mm F4.5-6.3 Apo.....	E++ £249	35mm F3.5 PC Shift.....
Pro S120 Mag.....	E+ £39	150-500mm F5.6-6.3 Apo DG HSM.....	E++ £489	40mm F2.8 SLR Voigtlander.....
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Meters

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Prof-Lux.....	E++ £22	X700 Black Body Only.....	E+ £59	16mm F2.8 AI Fisheye.....
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Bisix 2.....	Unused £39	SRT100 + 55mm f1.8 Pf.....	E+ £49	24mm F2 AIS.....
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DigiSky.....	E++ £249	25-50mm F4 AIS.....
Lunaxis 3.....	E+ £49	As Seen £29	28mm F2.8 SLR Asph Voigtlander.....
Lunaxis 3S.....	E+ £79	10.5mm F2.8 G AF ED DX Fisheye.....	Mint- £369	30-300mm F4.5 AI.....
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Variosix F.....	E+ £79	14mm F2.8 AE ED AS IF MC Samyang.....	Mint £229	E+ / Mint- £129 - £169
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Stratite.....	E+ £199 - £269	17mm F3.5 ATX Tokina.....	E+ / Mint- £129 - £179	135mm F2 AIS.....
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L458 Digital Flash.....	Unused £39	18-200mm F3.5-5.6 G AF5 DX VR.....	300mm F4.5 FEI AIS.....
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Digilite F.....	As Seen £59	18-300mm F3.5-5.6 G ED VR AFX DX.....	400mm F4.5 Nikkor-Q Auto.....
Weston Euromaster.....	E+ £69	18-300mm F3.5-5.6 AF5 DX VR.....	E+ £429	E+ / Mint- £750
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Flashmeter III.....	E+ / E++ £75 - £99	20-35mm F2.8 AFD.....	Exc / E+ £299 - £449	18mm F4.5 AF ZF Zeiss.....
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Spherical Meter Diffuser.....	Mint- £15	20mm F3.5 Color Skopar SLR Voigtlander.....	20mm F3.5 Color Skopar SLR Voigtlander.....
Spotmeter F.....	E+ £179	21mm F2.8 ZF Zeiss.....	E+ / Mint- £299	21mm F2.8 ZF Zeiss.....
Spotmeter M.....	E+ £179	21mm F3.5 AF ZF Zeiss.....	E+ / Mint- £299	21mm F3.5 AF ZF Zeiss.....
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Flashmeter.....	E+ / E++ £69 - £79	24-50mm F3.4-5 AFN.....	24mm F2.8 AF ZF Zeiss.....
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12mm F8 Fish eye Spironite.....	E+ £99	24mm F1.4 G AF5 ED.....	Mint- £109	24mm F3.5-5.6 G AF5 AF.....
16-80mm F3.5-4.5 ZA Sony.....	E+ / E++ £329 - £339	24mm F2.8 AFD.....	E+ £219	24mm F3.5-5.6 G AF5 AF.....
17-35mm F2.8 ZA Sony.....	E+ / E++ £179 - £199	24mm F2.8 AF.....	E+ / E++ £219 - £349	24mm F3.5-5.6 G AF5 AF.....
18-200mm F3.5-6.3 DT.....	E+ / E++ £149 - £229	28-200mm F3.8-5.6 G AF5 Tamron.....	Mint- £79	24mm F3.5-5.6 G AF5 AF.....
18-250mm F3.5-6.3 DT Sony.....	E+ / E++ £239	28-300mm F3.5-5.6 G AF5 VR AF5 VR.....	24mm F3.5-5.6 G AF5 AF.....
18-70mm F3.5-5.6 DT Sony.....	E+ / E++ £59	28-300mm F3.5-5.6 G AF5 VR AF5 VR.....	24mm F3.5-5.6 G AF5 AF.....
20-35mm F3.5-4.5 AF.....	E+ £199	35-105mm F3.5-4.5 AF.....	E+ / Mint- £499 - £529	24mm F3.5-5.6 G AF5 AF.....
20mm F2.8 AF.....	E+ £199	35-135mm F3.5-4.5 AF.....	E+ / Mint- £79	24mm F3.5-5.6 G AF5 AF.....
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24mm F2 ZA SSM Sony.....	E+ / Mint- £889 - £899	35-70mm F3.8-5.6 G AF5 Tamron.....	Mint- £79	24mm F3.5-5.6 G AF5 AF.....
24mm F2.8 AF.....	E+ £149	35mm F1.8 AF5 DX.....	E+ / Mint- £849	24mm F3.5-5.6 G AF5 AF.....
28-70mm F2.8 AF.....	E+ £349	35mm F2 AF5.....	E+ / Mint- £109	24mm F3.5-5.6 G AF5 AF.....
28-75mm F2.8 D.....	E+ £249	35mm F2 Distagon ZF Zeiss.....	E+ £389	24mm F3.5-5.6 G AF5 AF.....
28-75mm F2.8 SAM Sony.....	E+ / E++ £299 - £349	35mm F2 Macro DX ATX Tokina.....	E+ / Mint- £249	24mm F3.5-5.6 G AF5 AF.....
28-80mm F3.5-5.6 AF.....	Exc / E++ £25 - £35	50mm F1.4 AF5 AF.....	E+ / Mint- £189	24mm F3.5-5.6 G AF5 AF.....
28mm F2.8 AF.....	E+ / £79	50mm F1.8 AF5 AF.....	Mint- £79	24mm F3.5-5.6 G AF5 AF.....
30mm F2.8 SAM Macro Sony.....	E+ / Mint- £119	55-200mm F4.5-6 AF5 DX VR.....	E+ / Mint- £109	24mm F3.5-5.6 G AF5 AF.....
35-105mm F3.5-4.5 AF.....	E+ £29	55-200mm F4.5-6 AF5 AF VR.....	E+ / Mint- £499 - £529	24mm F3.5-5.6 G AF5 AF.....
35-70mm F3.5-4.5 AF.....	E+ £249	55-200mm F4.5-6 AF5 AF VR.....	E+ / Mint- £499 - £529	24mm F3.5-5.6 G AF5 AF.....
50mm F1.4 AF Sony.....	E+ £169	60mm F2.8 AF Macro.....	E+ / Mint- £249	24mm F3.5-5.6 G AF5 AF.....
50mm F1.7 AF.....	E+ £69 - £89	70-200mm F2.8 AF5 ED VR.....	E+ / Mint- £689	24mm F3.5-5.6 G AF5 AF.....
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75-300mm F4.5-6 AF.....	E+ £49	70-300mm F4.5-6 AF5 VR.....	E+ / E++ £259 - £279	24mm F3.5-5.6 G AF5 AF.....
75-300mm F4.5-6 D.....	E+ / E++ £49 - £89	75-240mm F4.5-6 AF5 AF.....	E+ / Mint- £499 - £629	24mm F3.5-5.6 G AF5 AF.....
80-200mm F2.8 APO.....	E+ £499	80-200mm F2.8 AF5 AF.....	E+ / Mint- £499	24mm F3.5-5.6 G AF5 AF.....
85mm F1.4 AF D.....	E+ £159	80-200mm F2.8 AF5 AF.....	E+ / Mint- £499	24mm F3.5-5.6 G AF5 AF.....
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300mm F4 Apo Tele Macro Sigma.....	E+ £199	105mm F2.8 AF5 G VR Macro.....	E+ / Mint- £499	24mm F3.5-5.6 G AF5 AF.....
500mm F8 Reflex Centon.....	E+ £45	150-600mm F5-6.3 SP USD Tamron.....	Mint- £749	24mm F3.5-5.6 G AF5 AF.....
700-400mm F4.5-6.6 AF Tamron.....	E+ / E++ £899	200-400mm F4.5-6 AF5 AF5 ED.....	E+ / E++ £139 - £159	24mm F3.5-5.6 G AF5 AF.....
75-300mm F4.5-6 AF.....	E+ £49	200-400mm F4.5-6 AF5 AF5 ED.....	E+ / E++ £2,989 - £3,099	24mm F3.5-5.6 G AF5 AF.....
80-200mm F2.8 APO.....	E+ £499	200-400mm F4.5-6 AF5 AF5 ED.....	E+ / E++ £2,989 - £3,099	24mm F3.5-5.6 G AF5 AF.....
85mm F1.4 AF D.....	E+ £159	200-500mm F5-6.3 Di LF AF Tamron.....	E+ / Mint- £449	24mm F3.5-5.6 G AF5 AF.....
85mm F1.4 AF G D.....	E+ £549	200-500mm F5-6.3 Di LF AF Tamron.....	E+ / Mint- £449	24mm F3.5-5.6 G AF5 AF.....
85mm F1.4 ZA Sony.....	E+ £799	200-500mm F5-6.3 Di LF AF Tamron.....	E+ / Mint- £749	24mm F3.5-5.6 G AF5 AF.....
90mm F2.8 SAM Macro AF Tamron.....	E+ £159	220 Insert.....	E+ / E++ £25 - £59	24mm F3.5-5.6 G AF5 AF.....
90mm F2.8 AF Macro Sigma.....	E+ £199	220 Insert.....	E+ / E++ £25 - £59	24mm F3.5-5.6 G AF5 AF.....
100-300mm F4.5-5.6 AF.....	E+ £79	220 Insert.....	E+ / E++ £25 - £59	24mm F3.5-5.6 G AF5 AF.....
100-400mm F4.5-6.7 AFo AF.....	E+ £289	220 Insert.....	E+ / E++ £25 - £59	24mm F3.5-5.6 G AF5 AF.....
100mm F2.8 ATX Macro Tokina.....	E+ £249	220 Insert.....	E+ / E++ £25 - £59	24mm F3.5-5.6 G AF5 AF.....
135mm F1.8 ZA Sony.....	E+ / Mint- £799 - £819	90mm F4.5 PC-TS Macro Schneider.....	E+ / Mint- £1,949	24mm F3.5-5.6 G AF5 AF.....
180mm F3.5 Di 1:1 Macro AF Tamron.....	E+ / E++ £499	105mm F2.8 AF Macro.....	E+ / E++ £329 - £349	24mm F3.5-5.6 G AF5 AF.....
200-500mm F5-6.3 Di LF AF Tamron.....	E+ / E++ £449	105mm F2.8 AF Macro.....	E+ / E++ £329 - £349	24mm F3.5-5.6 G AF5 AF.....
300mm F4 Apo Tele Macro Sigma.....	E+ £199	105mm F2.8 AF5 G VR Macro.....	E+ / Mint- £499	24mm F3.5-5.6 G AF5 AF.....
500mm F8 Reflex Centon.....	E+ £45	150-600mm F5-6.3 SP USD Tamron.....	Mint- £749	24mm F3.5-5.6 G AF5 AF.....
700-400mm F4.5-6.6 AF Tamron.....	E+ / E++ £899	200-400mm F4.5-6 AF5 AF5 ED.....	E+ / E++ £2,989 - £3,099	24mm F3.5-5.6 G AF5 AF.....
75-300mm F4.5-6 AF.....	E+ £49	200-400mm F4.5-6 AF5 AF5 ED.....	E+ / E++ £2,989 - £3,099	24mm F3.5-5.6 G AF5 AF.....
80-200mm F2.8 APO.....	E+ £499	200-400mm F4.5-6 AF5 AF5 ED.....	E+ / E++ £2,989 - £3,099	24mm F3.5-5.6 G AF5 AF.....
85mm F1.4 AF D.....	E+ £159	200-500mm F5-6.3 Di LF AF Tamron.....	E+ / Mint- £449	24mm F3.5-5.6 G AF5 AF.....
85mm F1.4 AF G D.....	E+ £549	200-500mm F5-6.3 Di LF AF Tamron.....	E+ / Mint- £449	24mm F3.5-5.6 G AF5 AF.....
85mm F1.4 ZA Sony.....	E+ £799	200-500mm F5-6.3 Di LF AF Tamron.....	E+ / Mint- £749	24mm F3.5-5.6 G AF5 AF.....
90mm F2.8 SAM Macro AF Tamron.....	E+ £159	220 Insert.....	E+ / E++ £25 - £59	24mm F3.5-5.6 G AF5 AF.....
90mm F2.8 AF Macro Sigma.....	E+ £199	220 Insert.....	E+ / E++ £25 - £59	24mm F3.5-5.6 G AF5 AF.....
100-300mm F4.5-5.6 AF.....	E+ £79	220 Insert.....	E+ / E++ £25 - £59	24mm F3.5-5.6 G AF5 AF.....
100-400mm F4.5-6.7 AFo AF.....	E+ £289	220 Insert.....	E+ / E++ £25 - £59	24mm F3.5-5.6 G AF5 AF.....
100mm F2.8 ATX Macro Tokina.....	E+ £249	220 Insert.....	E+ / E++ £25 - £59	24mm F3.5-5.6 G AF5 AF.....
135mm F1.8 ZA Sony.....	E+ / Mint- £799 - £819	90mm F4.5 PC-TS Macro Schneider.....	E+ / Mint- £1,949	24mm F3.5-5.6 G AF5 AF.....
180mm F3.5 Di 1:1 Macro AF Tamron.....	E+ / E++ £499	105mm F2.8 AF Macro.....	E+ / E++ £329 - £349	24mm F3.5-5.6 G AF5 AF.....
200-500mm F5-6.3 Di LF AF Tamron.....	E+ / E++ £449	105mm F2.8 AF Macro.....	E+ / E++ £329 - £349	24mm F3.5-5.6 G AF5 AF.....
300mm F4 Apo Tele Macro Sigma.....	E+ £199	105mm F2.8 AF5 G VR Macro.....	E+ / Mint- £499	24mm F3.5-5.6 G AF5 AF.....
500mm F8 Reflex Centon.....	E+ £45	150-600mm F5-6.3 SP USD Tamron.....	Mint- £749	24mm F3.5-5.6 G AF5 AF.....
700-400mm F4.5-6.6 AF Tamron.....	E+ / E++ £899	200-400mm F4.5-6 AF5 AF5 ED.....	E+ / E++ £2,989 - £3,099	24mm F3.5-5.6 G AF5 AF.....
75-300mm F4.5-6 AF.....	E+ £49	200-400mm F4.5-6 AF5 AF5 ED.....	E+ / E++ £2,989 - £3,099	24mm F3.5-5.6 G AF5 AF.....
80-200mm F2.8 APO.....	E+ £499	200-400mm F4.5-6 AF5 AF5 ED.....	E+ / E++ £2,989 - £3,099	24mm F3.5-5.6 G AF5 AF.....
85mm F1.4 AF D.....	E+ £159	200-500mm F5-6.3 Di LF AF Tamron.....	E+ / Mint- £449	24mm F3.5-5.6 G AF5 AF.....
85mm F1.4 AF G D.....	E+ £549	200-500mm F5-6.3 Di LF AF Tamron.....	E+ / Mint- £449	24mm F3.5-5.6 G AF5 AF.....
85mm F1.4 ZA Sony.....	E+ £799	200-500mm F5-6.3 Di LF AF Tamron.....	E+ / Mint- £749	24mm F3.5-5.6 G AF5 AF.....
90mm F2.8 SAM Macro AF Tamron.....	E+ £159</			

ADDED EXTRAS

7

Key things
you need to
know about
the Nikon
D7200

Replacing the D7100 at the top of the DX-format range, the D7200 improves and builds upon what came before, rather than overhauling it. Thinking of buying one? Here's what you need to know.

1 New AF unit

While the two-year-old D7100 used a Multi-CAM 3500DX AF sensor, the D7200 deploys a Multi-CAM 3500 II AF sensor, as featured on top-end Nikon models. This isn't the only feature that the D7200 borrows from its larger FX-format cousins, as we shall see. The key difference to take from this unit is that it improves low-light performance. For the first time in a DX camera, the D7200 is capable of acquiring focus in lighting conditions as low as -3EV (compared to -2EV on its predecessor). Nikon states that such capabilities will aid both shooting in demanding conditions and capturing video as well.

**2 Near Field
Communication added**

In a first for all Nikon DSLRs, the D7200 comes equipped with Near Field Communication, allowing for lightning-fast image transfer to similarly equipped devices with a single touch. It is also outfitted with regular Wi-fi, which also allows for remote control of the camera with a smartphone. This is an encouraging sign from Nikon, which has in the past been pretty thoroughly outclassed by its rivals in terms of connected cameras. Here's hoping this trend continues in the future.

3 ISO range expanded

The D7100's original native ISO range of 100-6400 has been nicely expanded to 100-25,600 in the D7200. It's extendable, too, but with a catch – you can push the D7200 all the way up to ISO 102,400, however Nikon has taken the slightly weird decision of making this mode monochrome only, so you're probably best off avoiding it unless in some kind of dire emergency, and if that's the case, maybe just do something else?



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4 Improved video

Nikon clearly didn't forget about videographers. Not only can the D7200 shoot 60p video (albeit only in 1.3x crop mode) but it also has a movie setting menu which allows for advanced audio and 'Picture Control' settings to be modified and stored. Movies can be recorded straight to the SD card slots or to an external recorder, and sound quality can be improved with Nikon's new optional ME-W1 Wireless Microphone.

5 Larger shot buffer

One aspect that somewhat hobbled the D7100, an otherwise highly impressive camera, was its limited shot buffer. Anyone who shoots continuously in burst mode would notice the camera's limitations pretty swiftly. The D7200 rectifies this, with a buffer that can accommodate 27 12-bit compressed Raw or 100+ JPEGs. Its maximum burst rate is 6fps, or 7fps in 1.3x crop mode, thanks to the new EXPEED 4 processor.

6 Better battery life

You'll be able to squeeze more life out of the D7200 than its predecessor, as Nikon claims that a single charge of the EN-EL15 lithium-ion battery will allow you to shoot up to 1,100 still images or 80 minutes of movie footage – a 15% increase on the D7100. Still no excuse for not taking spares though. Spare batteries save lives, kids (probably).

7 It's got serious competition

If you're in the market for something like a D7200 then you've no shortage of options. There's the Canon EOS 7D Mk II, Sony's Alpha 77 II and the older Pentax K-3. And that's just DSLRs; on the mirrorless side there's Fujifilm's X-T1, the Olympus OM-D E-M5 Mk II and the Samsung NX1, to name a recent few.



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